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USA's MARKET CRASHES OF 1929 AND 2008
Comparison of events preceding the history's greatest crashes

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TABLE OF CONTENTS

ATTACHMENTS

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Abstract:

The objective of this research was to find out what were the differences between the events preceding market crashes of 1929 and 2008. The findings would serve the purpose of reminding everyone how these situations have developed until the impending crash and crisis. This should prove to be valuable help in the future when people are facing the same conditions again.

The research's approach was a general historical view on the matter. Descriptive research methods were used to gather and analyze the data. Various sources from literature, articles, speeches, research papers and statistics databases were being used to compile the data. The research consists of macroeconomic theories, bubble theories, research data and conclusions.

The results of the research were almost as expected. Not much had changed in 80 years in the financial sector's ability to not get drawn into self-caused crises. These events before the history's greatest crashes were different in their nature but contained all the same elements. Good future prospects combined with extraordinary profits because of financial innovation equalled an economic bubble. Many other aspects were the same also, such as lack of regulation. This means that more work should be done on the process of inflating bubbles in order to find ways to avoid the possible catastrophes caused by the bursting bubble.

Professor Galbraith's words "As a protection against financial illusion or insanity, memory is far better than law." held high importance in the research. It should be everyone's obligation to ponder and try to understand these financial aspects as they can cause great abundance, or great distress depending on what have been learned from the history. This research paper can be taken as a small step towards that goal and as a reminder of past.

Keywords: market crash, bubbles, speculation, comparison, financial innovation, the Great Depression, financial crisis

METROPOLIA AMMATTIKORKEAKOULU

Koulutusohjelma:	Liiketalous
Suuntautumisvaihtoehto:	Talous ja rahoitus
Opinnäytetyön nimi:	USA:n markkinaromahdukset 1929 ja 2008. Romahduksia edeltävien tapahtumien vertailu
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Tiivistelmä:

Tutkimuksen päämääränä oli selvittää vuosien 1929 ja 2008 markkinaromahduksia edeltävien tapahtumien eroja. Tavoitteena oli muodostaa käsitys laajasti molemmista tapahtumista; miten tilanteet kehittyivät, miten teoria tuki tapahtumia, miten ne vertautuivat muihin historian vastaaviin tilanteisiin sekä mitkä olivat keskeisimmät elementit. Asian tutkimisesta ja ymmärtämisestä on hyötyä, jos ja kun samanlainen tilanne kohdataan jälleen kerran.

Tutkimuskohdetta lähestyttiin yleisesti historian kannalta. Tutkimusmetodina käytettiin fenomenologista lähestymistapaa. Aineistoa kerättiin laajasti kirjallisuudesta, lehtiartikkeleista, puheista, tutkimuksista ja tietokannoista. Tutkimus oli jaoteltu seuraavasti: histo-ria, makroekonomian teoriat, kuplateoria, data ja johtopäätökset.

Tulokset tutkimuksesta olivat lähes odotettuja. 80 vuodessa ei ollut tapahtunut suuria muutoksia, vaan rahoitusala aiheuttaa vieläkin suuria kriisejä omilla teoillaan. Vertailukohteiden tapahtumat olivat luonteeltaan erilaisia, mutta perusongelmat olivat säilyneet yli vuosien. Loistavat tulevaisuudennäkymät yhdistettynä ennennäkemättömiin tuotto-odotuksiin, jotka oli saatu aikaan ”rahoitusinnovoinnilla”, olivat tutkimuksen mukaan vahvasti molempien kasvavien kuplien taustalla.

Tutkimuksen perustana ja kantavana voimana oli professori Galbraithin lausahdus: ”Muisti on paljon parempi suojaamaan meitä taloudellisilta järjettömyyksiltä kuin laki.” Talousasioiden ymmärtämisen ja niiden pohtimisen tulisi olla jokaisen velvollisuus, sillä talouden tapahtumista voi aiheutua niin hyviä kuin erittäin huonoja asioita sen mukaan, mitä menneestä on opittu ja mitkä olisivat oikeat toimenpiteet nyt. Tämä tutkimus otti kantaa juuri tähän muistin hyödyntämisen tarpeeseen sekä historiasta oppimiseen.

Avainsanat: markkinaromahdus, suuri lama, talouskriisi, vertailu, spekulaatio, kupla

1. INTRODUCTION

”If history repeats itself, and the unexpected always happens, how incapable must Man be of learning from experience.”

George Bernard Shaw
Irish dramatist & socialist (1856 - 1950)

This paper deals with the quotation above. I will try to prove that over the course of 100 years not much has changed in the world of financing. Despite of vast technological progress, countless of hours spent on studying economics, new policies, prosperous time’s etc. people in the United States and Europe found themselves at the centre of a total collapse on the year 1929 and beyond. Then after 80 years, despite of vast technological progress, countless of hours spent on studying economics, new policies, prosperous times etc. people in the United States and Europe found themselves at the brink of another total collapse .The only difference being that the second time around it seems like the impending catastrophe has been avoided. How can this be possible and what insanity is going on behind the scenes and more importantly, right in front of our eyes. I will be comparing these two of the history’s greatest crashes mainly caused by speculative financing and look into what lead to them in order to make sure it won’t happen again.

I will go through the history of speculative booms and busts and the theory behind business cycles, macroeconomic theories and speculative bubbles in general, including the psychological aspects. Special focus will be put on the events preceding the crashes of 1929 and 2008 as understanding the formation of bubbles and elements which keep inflating them is of major importance. Both events had many aspects in common, so it is necessary to analyze them and see which mistakes could be left undone the next time. I will be using descriptive research method to answer questions “What happened? What did these two booms and busts had in common?” with sources from research papers, literature, articles and statistic databases. The gathered information will be crucial to avoid future financial crises. Or as Mr. Galbraith put it:

”As a protection against financial illusion or insanity, memory is far better than law.”

John Kenneth Galbraith
Honorary economist (1908 - 2006)

2. AN EXAMPLE OF A SPECULATIVE BOOM AND BUST

Let's start off with defining speculative booms with an imaginary event. What are they and how they get started? A speculative boom is an "event" where people speculate on the value of a subject rising constantly. The idea behind this is, that if the prices of, lets say apples, are rising without an end in sight, then one will think that "if I buy an apple today with 1€, it can be worth of 1,2€ tomorrow so I will make a 20% profit". This is a perfectly logical way of thinking and anyone of us would do the same if we had no other information available except for the price of apples that rise endlessly. (Chapter 5.3) Everyone will sell their possessions, investments and takes a loan from a bank in order to buy more apples thus making the best possible profit. Some companies are even willing to sign a paper which gives one the right to own an apple, having only to pay 35% of the price and give the bought paper as a collateral for the loan, a win/win situation. At that point no actual apples are needed anymore so the market is relieved from the restraint of possession. The price of apples keeps on rising because more and more eager investors looking for good profits start to appear and so begins a speculative boom, a boom with no economic fundamentals behind. People are happy that the prices keep going up and their investment is soon worth 5 times more than on the time of trade, they could be forgiven for thinking that "We have figured out economics and now only good times await us". (Galbraith 1975, 32-35 Chapter 5.1.2)

Then, on one day, rumours start to arise that apples might not actually be worth as much as they currently are and major apple holders have started to sell their stock. An investigation will follow and big headlines about apples start to appear to the shock and horror of many; apples are only fruits that not only are anything special but will also rot in few months. The floodgates open and the bust begins. Everyone wants to sell their apples with some profit while they still can so they rush into the markets desperately searching for buyers. Prices start to plummet due to low amount of willing buyers and soon nobody will buy an apple at a price greater than 20 cents. The original investment of 1 euro/apple lost 80% of its value, and a 5€/apple investment at the peak of the boom lost 96% of its value. Those who invested everything they had, lost everything. Those who invested everything and borrowed money from the companies who funded the speculation lost everything and quite a bit more. The apple investors are left to ponder "How could have I been so stupid not to see what was happening since the beginning. I will never do the same mistake again". (Galbraith 1975, 32-35)

3. HISTORY OF SPECULATIVE BOOMS AND BUSTS

Here I described shortly a few distinctive speculative booms of history to show that these events are not just unique to the modern era.

3.1 Tulip mania 1635-1637

The first recorded serious example of a boom/bust cycle happened as early as 1636 in the Netherlands. People were speculating, not with something as naive and dull subject as apples which nobody would ever really fall into speculating with in real life, but with tulip seeds. In the 17th century tulips were a luxury item and during that time there was a virus in some of them which made them look even more spectacular and therefore being rarer. Due to this, farmers growing tulips wanted to get their hands on these rare tulip bulbs and so more and more people were entering the bulb market, also people who were planning to get rich just by the increasing prices.

As the season for harvesting the seeds were only once a year, the Dutch created a type of future market where people could buy and sell contracts for getting tulip bulbs at the end of the season. This enabled trading with no substance; it was just a promise of receiving bulbs at some point. (Garber 2000, 37–38, 44–47) It went by name "*windhandel* (literally "wind trade"), because no bulbs were actually changing hands" (Goldgar 2007, 322) Needless to say, the price of the bulbs got way out of hand. From 12th November 1636 to 3rd February 1637, the price of a tulip bulb not just doubled or tripled, but became two hundred fold, an increase of 20000%.

After that the market obliterated before a single real bulb changed hands. (Thompson 2006, 101, 109–11) (Garber 1989, 543–544) Not all facts are certain from that era, so it is still being disputed how great the financial effects really were. (Thompson 2006, 100) But the mechanics and the utopia of getting rich fast was already there which makes this event the first speculative bubble of many to come.

3.2 Florida land boom 1925-1928

In the 20s Florida was marketed as the best holiday location due to pleasant climate and good transportation connections with the aviation development. Due to beginning of the 20s being prosperous times, it became increasingly popular to buy a lot from Florida near the sea. More and more land was being sold and prices kept increasing which brought in

the speculators. Lines like “near Jacksonville” (a city close to the sea) were being used in marketing to describe 65 mile distances.

Trying to convince people into buying these lots at a high price became a profession. The boom came into an end with the help of two hurricanes which devastated the coastline. “In 1925 bank clearings in Miami were $1,066,528,000; by 1928 they were down to $143,364,000”. (Galbraith 1975, 35) This was the first clear speculative bubble since the South Sea case and people did not seem to learn much from it as the Great Crash was only a few years away. (Galbraith 1975, 32-35)

3.3 Asset price bubble in Japan 1986-1991

Japan was in a favourable economic situation after the World War II. Japan’s imports were doing well so the country had a large trade surplus. People were also saving money which enabled banks to lend more money followed by companies being able to borrow easier. The increasing available money was being invested/speculated into real estate and stock markets. With the stock market rising, investing being done and credit being easily available people came to expect a continuous rise, with these factors combined the markets overheated.

The bust started in 1990 when Nikkei 225, Japan’s stock exchange index, dropped from 38,900 into 15,000 points in 1992. In the real estate market it took a decade of slow growth and some $10 trillions assets being lost to finally burst the bubble. To help the crumbling economy up from the bust, interest rates were set to 0 and huge government debts aimed for spending were taken in order to boost the economy. (Wiki, BOJ 2009, Krugman, 1999) This example bears valuable information when looking into the current financial crisis.

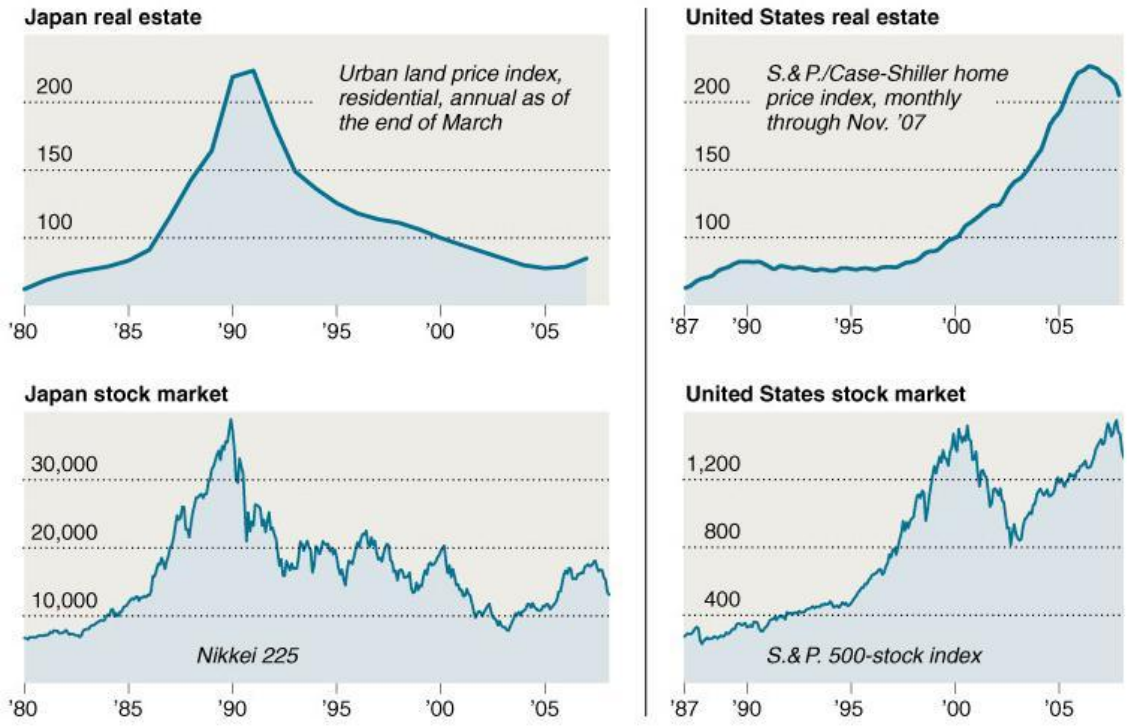


CHART 1: Comparison of Japan's asset crisis to the United States' situation (Lohr 2008)

3.4 Dot-com bubble 1995-2000

The dot com bubble was created by heightened media attention to new technological discoveries towards the end of the 90s. The Internet was rising in popularity and stock markets, especially NASDAQ, the technology stock exchange of the USA, was booming because of intensive speculation and investing to almost any IT related stock. Many new companies were founded and websites made. Anyone with a website was set to become rich as the bubble was inflating and everyone was pouring money into these next generation companies. (Buttell, 2010)

The NASDAQ composite peaked on 10 March 2000 at 5135 points, an increase of 570% in 5 years from the peak value of 902 on 15 June 1995. (Statistical Milestones NASDAQ, 2010) In the year 2000, the market value of the six largest IT companies of USA was equal to 18% of USA's GDP, way above the value of 4,3% in 2008 which can be regarded as "normal" amount. (Attachment 10) The market also had, at least, as spectacular crash as the growth. Between 2000 and 2002, the bubble burst and wiped out five trillion of market value. (Buttell, 2010) The same kind of frenzy on buying stock had not been seen since 1929.

4. BUSINESS CYCLES

There is a widespread agreement on the existence of business cycles. Business cycles basically means that if there are good times (booms), bad times (recessions) ought to follow. These cycles on real estate has been proven to occur about 18-year-interval. (Alexander, 2002) The question "how can we understand, predict and avoid the downswings happening in the cycle?" has been stuck on economists' minds because if this question could be answered, we would be able to avoid economies running into troubles and recessions. Different macroeconomic business cycle theories to find answers have been made throughout the times, the first and most popular being Keynesian approach and monetary approach. More recent theories are rational expectation theory and real business cycle theory (Parkin & Powell & Matthews 2005, 702-705)

It should be noted, when researching theories, for example physics, you can always be certain that in the end the right answer will be found if enough research has been made. But when researching capitalist economy, you are looking into something that man has created, something that is constantly changing, with no set rules, with everyone's decisions having an effect on. So in the end, no matter how much research you do, all you can have is a good guess. This does not mean that these theories are useless and hold no value. It means that none of them should be taken as the 'correct' way of doing things, but instead to look for ideas and clues to what is happening *currently* and make decisions and predictions based on that.

4.1 Basic assumptions

The basic assumption behind a business cycle is the role of investment being the most important. When times are good, more investments are being made to increase output. This triggers an event where there is more demand for production, which increases demand for labour, which increases the wages, which increases the available money to be spent, which increases demand for goods and the cycle begins again. However, after enough capital has been invested in production the law of diminishing returns starts to operate. It states that "as the quantity of capital increases, with the quantity of labour remaining the same, the gain in productivity from an additional unit of capital eventually diminishes." (Parkin 2005, 702) This reduction in efficiency of capital makes the profit rate fall and reduces the

willingness to invest. This brings the investment rates down and with falling investment comes the feared recession. With investing being low and capital stock growing slowly means that the amount of capital per hour of labour is decreasing. The low amount of capital per hour of labour brings up opportunities to make profitable investments which start's the business cycle again. So whatever the impulses to change the economy are, if they affect the amount of investment it will affect the economy greatly. (Parkin 2005, 702)

4.2 Keynesian model

Now knowing what we should expect from a theory, let's take a look at the first one. Keynesian theory made by John Maynard Keynes (1883-1946). He was an economist who wrote his greatest publications before and after the Great Depression. His assumption for a business cycle is that the present state is the result of future expectations. If people think that in two months there will be more demand than today, it is a good idea to invest now. And what things do people take into account before making this decision? They can be almost anything, for example the general atmosphere, plans to change taxation, promising new economy rising in the East, trade barriers being set around the world, a discovery of a new huge oil field in Texas, news of financing industry being heavily indebted, and so on. (Parkin 2005, 703-704)

These events will then affect positively or negatively on the decision of making an investment today. The longer the good times are in sight and full employment closes in, the higher the cost for employment will be due to a shortage in the available work force, and so an inflationary gap arises - everything becomes more expensive. (Attachment 1) From this situation on it will be easier for any bad news - or impulses - to cancel those crucial plans for new investment thus turning the growth downwards. (Parkin 2005, 703-704) If this happens and the economy slows down and growth stops, then in the Keynesian view the correct measure for recovery would be to create good news by investing even if the future looks unfriendly at the moment. Governments have the incentive to take this action in order for unemployment not to rise which would fuel the recession. Taking debt to invest in construction projects to improve both current economic situation and also infrastructure for the future is considered to be one good method. On the contrary, if economy is doing well, the governments can use their available resources to pay back loans and save up money for the next slump instead of overheating the markets with more investment.

4.3 Monetarist model

Another famous economist who created a theory concerning macroeconomic issues is Milton Friedman (1912-2006). He is the originator of monetarism and was the main challenger of Keynesian economics. The monetarist theory of the business cycle is based on Friedman's work and it argues that the quantity of money available is the main reason of booms and recessions in the economy. The idea is simple; an increase in money supply puts the economy into a growing path, decrease of money supply makes the economy slump. The amount of money in circulation depends on the interest rates, which gives the power to control growth/slump to the central banks of each respective country that has their own currency. The second assumption in monetarist theory is that if unemployment rises above its natural state, the wages and the price level start to fall. If unemployment is below its natural state, the wages start to rise. (Attachment 2)

For example, the Bank of England is currently lending money to banks at a 5% interest rate. Now they have come to notice that the economy is sliding into a downturn and something must be done. Unemployment rises and the wages start to fall. A decision will be made at the Bank of England to reduce the interest rate to 3,5% and therefore pumping out more money to the markets. (Parkin 2005, 704-706) This enables companies to get cheaper loans which makes investing more attractive. If times are good, the interest rate should be raised to control overheating and to have a buffer for future cutting of rate.

These are the basics of the two most often used theories in economics. Since then new theories have been created, for example the real business cycle theory which argues that growth of productivity from technological progress impulses the economy. (Parkin 2005, 709-712) That, and many other theories, can hold value. In this research, the Keynesian and monetary models will be used since those were around and available for use already in 1929 and of course 2008.

5. SPECULATIVE BUBBLES

"... a sharp rise in price of an asset or a range of assets in a continuous process, with the initial rise generating expectations of further rises and attracting new buyers-generally speculators, interested in profits from trading in the asset rather than its use as earning capacity." (Kindleberger 1987)

Usually a 'bubble' or 'speculative bubble' can be identified when speaking of business cycles and changes in economic growth. I am not arguing that they are the sole reason for recessions and slumps but rather as the initiators or embodiment of impending crisis. In some cases bubbles have formed and deflated leaving only smaller impact on global scale, for example the dot-com boom. (Greenspan 2010, 10) Then there are bubbles which were a part of the cause for great havoc: starting from 1929 a drop of 26% in total GDP was seen in four years (Attachment 3), Japan's 1990s asset price crisis made Japan's GDP growth lag behind rest of the world for ten years (Attachment 4), current recession has been estimated to have brought approximately 5% slump in GDP to the world's economy. (Attachment 5) All of these downturns have had one round object in common: a bubble.

This is the reason why I think it is important to try to understand the structure and behaviour of bubbles; how they form and who are behind them, how they continue on gaining momentum, what can be linked to the expanding bubble, how to deflate the bubble with the least detriment, does a bubble always precede a slump, how can bubbles be prevented of forming? These are all important questions which, more importantly, should have answers too. In order to find these answers, theories and research on bubbles have been made. I will go through and draw my conclusions of two theories with two relatively different points of view on the subject.

5.1 Bubble theory

In the last decades a great amount of research has been done on bubbles. Michael Brunnermeier in his 2004 abstract on bubbles divides the literature into four different ways of approach:

1. Analyzing bubbles when rational investors have the same information and expectations of future value.

2. Analyzing bubbles when rational investors don't have the same information and expectations of future value.

3. Analyzing bubbles when rational and irrational (behavioural) investors interact.

4. Analyzing bubbles when investors have a different opinion about the fundamental value of the asset. (Brunnermeier 2004, 1-2, 15)

The first and second groups can be put under group "rational bubbles" which has its roots in the late 70s. The idea behind the rational theories is that it is profitable for the rational trader to "ride the bubble" and take a position which favours the continuation of the bubble. The third group focuses on the psychological factors (herding behaviour, bandwagon effects) in the bubbles. (De Grauwe 2004, 2) In the fourth group, investors "prior beliefs are heterogeneous ... consequently they agree to disagree about the fundamental value of the asset." (Brunnermeier 2004, 2)

I will look more closely on models three and four since the first two are under heavy critizism because of their assumptions in traders' ability to be completely rational, understand *all* relevant information and then act accordingly. (De Grauwe 2004, 2) For example, it has been proved in laboratory conditions that taking risks "depends at least as much on situational as on personality factors." (De Bondt 2003, 207) Also the 'rational theories' do not sufficiently explain why there is a crash in the end. (De Grauwe 2004, 3)

5.2 Behavioural finance

Paul De Grauwe and Mariana Grimaldi have published a research paper "A Theory of Bubbles and Crashes" in January 2004 and a revised version in February 2004 in which they present a model on bubbles which I'd regard as a variation of model three and four described before. They develop "a simple model of the exchange rate in which agents optimize their portfolio and use different forecasting rules". (De Grauwe 2004, 1) The general assumption is that individual traders have access to the same information but they make different interpretations based on their own abilities and beliefs. De Grauwe and Grimaldi then divide the traders into two different groups: "fundamentalists who use fundamental information and technical traders (chartists) who extrapolate past exchange rate changes". (De Grauwe 2004, 3)

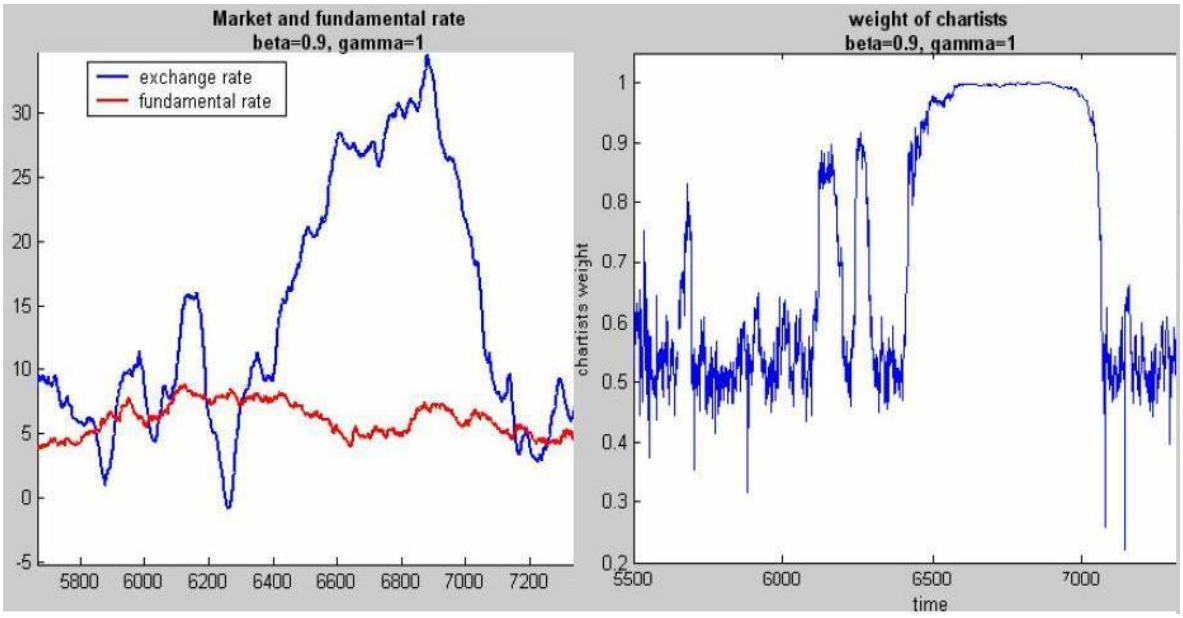
Exchange rates here are used to describe changes in the value of any risky asset. The interaction between these two groups using two different simple rules to predict the future is the cause for forming of bubbles and crashes that follow. (De Grauwe 2004, 3) Fundamentalists base their future expectations "on a comparison between the market and the fundamental exchange rate" which means that if the exchange rate at the moment is exceptionally high/low compared to the fundamentals, it is expected to return back to the fundamental level. (De Grauwe 2004, 5)

For example, fundamentals behind a company's stock value would give it expectations for 5% growth rate but currently it is growing at the pace of 15%. The fundamentalist forecast would then be that the value of the stock is going to go down. This would reduce the chances for a bubble to form as it would bring the level of growth back to the normal "fundamental" levels. The chartists, on the other hand, look into the past growth rate and extrapolate it into the future. Using the same example, they would see the growth of 15% in the past as an indication of more growth in the future. Needless to say, this forecast has no fundamental substance behind it but for the moment it provides the best profit expectancy.

The longer the upward trend continues above the fundamental level, the more traders will turn into chartists for the sole reason that they are making more money. This is because fundamentalists are selling their assets (they believe that the value is going down) and therefore missing the profit from the rising rates due to increasing amount of chartists entering the markets. When a bubble forms, it is riskier to bet against it than in favour it. (De Grauwe 2004, 6, 12-14, 29)

"There is nothing so dangerous as the pursuit of a rational investment policy in an irrational world." *John Maynard Keynes*

Damodaran on Valuation: Second Edition

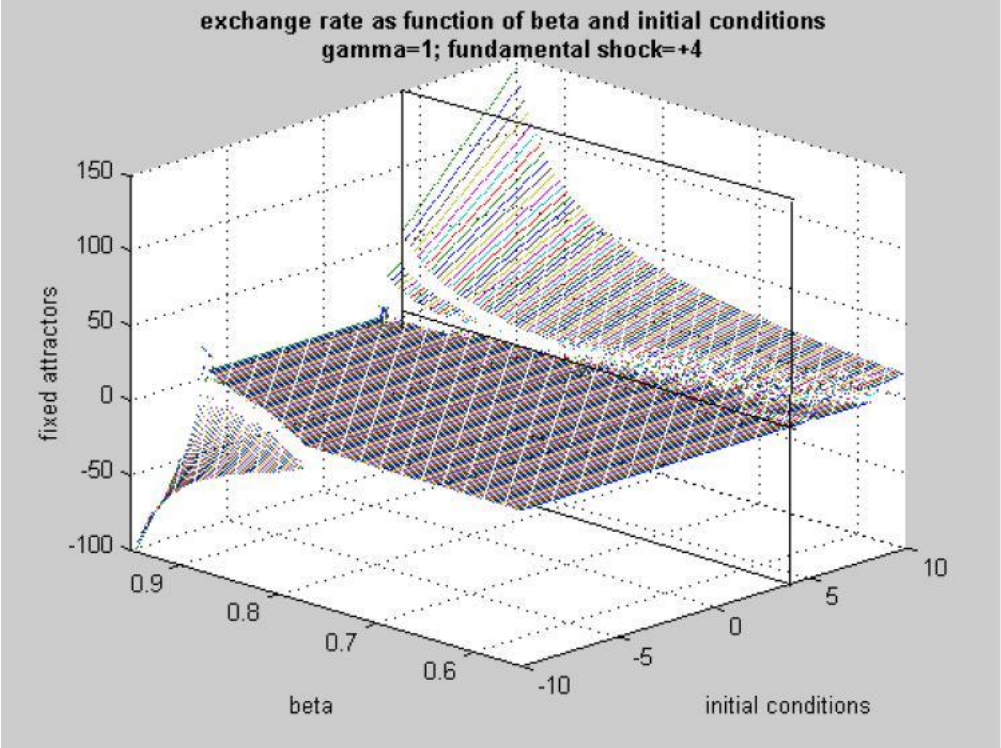


GRAPH 1: Weight of chartists and the market rate. (De Grauwe 2004, 13)

In Graph 1 it has been clearly presented that whenever the current rate differs from the fundamental rate, the more chartists are participating in the markets. This works both below and above the fundamental rate as the rules of chartist forecasting work both ways. The limit for the growth of the bubble is reached when nearly 100% of the participants in the market have turned into chartists. At this point forward, the self-fulfilling growth slows down as no more new chartists can enter the market. As the growth slows down the expectations for, say growth of 15%, can no longer be maintained so another forecasting alternative, fundamentalism, becomes more attractive. (De Grauwe 2004, 13-14)

The reason why the growth of bubble is slower than the burst is quite simple: when the bubble starts to grow, there are fundamentalists along the way who think the market is overpriced so they are selling their assets thus bringing the rate down and slowing the growth. At the peak of the bubble, when the market is crowded by people who expect that the market should be growing by 15% but in reality it is growing only by 2%, it is then much easier to jump into the bandwagon and bet for a falling market, in other words, to become a fundamentalist. “This triggers a fast decline in the share of technical trading, back to its normal level of tranquil market. A crash is set into motion.” (De Grauwe 2004, 14)

How does a bubble like this get into motion then? This can be explained by examining Graph 2.



GRAPH 2: How a bubble forms (De Grauwe 2004, 19)

- Beta: amount of chartists on the market (0.5 mean amount, 1.0 everyone)
- Initial conditions: fundamental shocks to the market (-10 being horrible, +10 extremely positive)
- Fixed attractors: chances for a bubble to form (-values chance for a negative bubble, +values chance for a positive bubble)

Graph 2 illustrates the chances for a bubble to form in the market using the variables described above. The normal situation would be as follows: initial conditions 0; no positive or negative shocks (news or future projections), beta 0.5; equal amount of fundamentalists and chartists participating in the markets. These two values form the chance for a bubble to form which is named fixed attractors in the chart. It can be observed that it is unlikely for a bubble to form if there is not plenty of chartists in the market and/or enough fundamental shocks. But when these two are combined, the chances rise rapidly. The black rectangle drawn on the chart shows the situation at +4 fundamental shocks. It indicates that only at very high level of chartists in the market there is a possibility for a bubble to develop. At this point though, any new positive fundamental shocks would greatly increase the chances for a bubble to occur. (De Grauwe 2004, 16-19)

In general it could be said, that when times are good and the future seems bright, any news of even better expectations for the future can be the trigger for a bubble. (De Grauwe 2004, 19) This model bears valuable information as it explains the reason for growth of the bubble and the crash which has to follow. I believe it can be used in practice due to its simplicity.

5.3 Bubbles due to limited arbitrage

This model, which could be grouped under "Analyzing bubbles when rational and irrational (behavioural) investors interact", has been under research by many academics in the past 20 years. I will use Markus Brunnermeier's view of the model. In it "rational, well-informed and sophisticated investors interact with behavioural market participants whose trading motives are influenced by psychological biases." (Brunnermeier 2004, 10) It takes into consideration of the general short-fall in rational theories, in which rational traders should be always against forming of a bubble, by providing three channels for "rational arbitrageurs" to benefit from a bubble. (Brunnermeier 2004, 10) Criticism to this theory comes from its separation of rational/irrational traders which creates "fundamental epistemological issues that are not fully addressed and difficult to resolve. Why is it that some agents are rational and others are not?" (De Grauwe 2004, 2)

The first pro-bubble channel is that, "fundamental risk makes it risky to short a bubble asset since subsequent positive shift in fundamentals might ex-post undo the initial overpricing". (Brunnermeier 2004, 11) This would mean that rational traders can not be too aggressive at bringing a bubble down. Second, the irrational traders can inflate the bubble so much that it affects the estimated profits of the rational traders if they try to burst the bubble. Going against the forming bubble would for sure cause losses in the short term. Short term loss, or any loss, is of great importance in the world of financing as it is a signal of future losses even if in long term the signal would prove untrue. This would give reasoning for a rational trader to participate in the bubble market. Third, "rational traders face synchronization risk" (Brunnermeier 2004, 11) because they are aware that there is a bubble but they can not bring the market down by themselves, which would be the best time to sell – you make the best profit, others suffer the fall.

But since no market operator can crash the market by themselves, it is then up to themselves to evaluate the best possible time to exit. In other words, "to ride the bubble"

and “beat the gun” as Keynes expressed (Abreu & Brunnermeier 2004, 174). The model also assumes that single rational traders become aware of the bubble at different times so they can not be sure if they are the first or last ones being aware. “Since there is no commonly known point in time from which one could start backward induction, even finite horizon bubbles can persist.” (Brunnermeier 2004, 12)

I will be using these two models to analyze the stock market bubble of 1920’s and the housing market bubble of 2007.

6. THE BOOM OF 1920s

Since this thesis is partly historic research some remarks should be done of that as well. Before starting to go into detail I want to share few points which I, as a representative of the younger generation, think are good to keep in mind while reading the upcoming events. First, when I thought about 1929 as a number, it first sounded in my mind almost like "stone age" when people were living simple lives and not much was going on so how could there even be any financial crisis if there wasn't even any proper financing. Well, this image might be true in the Finnish countryside but when looking at New York, you could see cars driving around, people taking cruises across the Atlantic to Europe, skyscrapers rising and so on.

One of the main characters of this paper, Wall Street and its bankers, were up and running – trying their best to make as much money as possible, just like today. JP Morgan, Goldman & Sachs, Lehman Brothers and many more were familiar faces during the time, just like today. From the trader filled hectic floor of New York Stock Exchange the stock ticker was feeding out almost real time information about stock prices and telefax was forwarding it all over America and Europe. (Galbraith 1975, 62) Federal Reserve Bank system had been created to act as the central bank controlling interest rates and being a lender to banks.

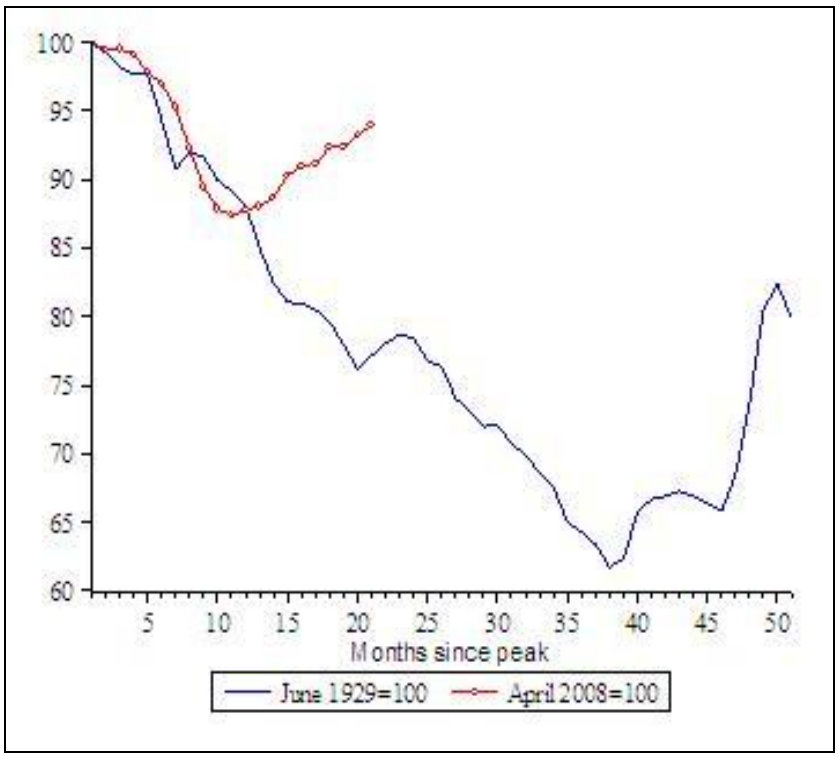
Some journalists and economists were trying to warn about impending crash with little success and politicians being reluctant of doing anything. (Galbraith 1975, 67, 158-159) Sounds familiar? Think so. Second point I want to make of that time -- is that people with their hopes and dreams were the same. With these two points in mind it's easy to say that not much have changed since then in this matter so there should be no prejudice when looking at the events occurring 80 years ago.

6.1 The basic setting

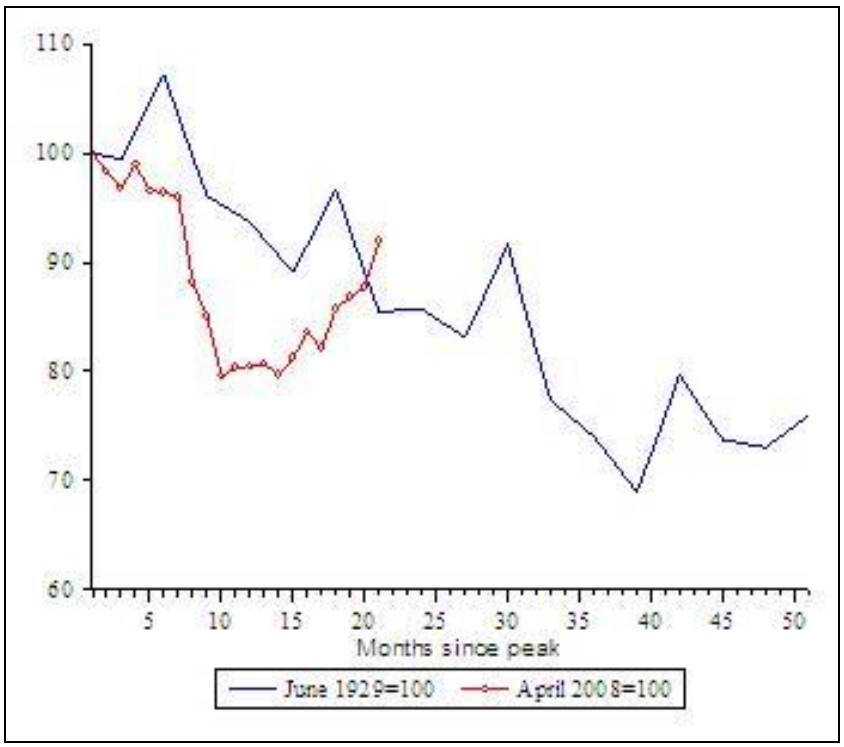
I will be mostly using literature by John Kenneth Galbraith for the background information of the events preceding the great depression. He has written a descriptive book "The Great Crash 1929" which is a classic study of that disaster. Most of his material is from the

general and financial press of the time (Galbraith 1975, 24), so it gives out the real feeling of what was going on as opposed to just looking at numbers. The basic setting is that there are two causes for business cycles: one is financial and one is real. Increase of money and credit by the banking system due to low interest rates and ease of funding is the financial side and the real side is increase in investment (Foldvary 2007, 2), in this case, speculation.

It has been earlier noted that the crash of 1929 was not the first or last time when an economic speculative bubble bursts. What makes it so extremely important to know about is the sole reason that its effects were so humongous on a global scale. Things surely changed quickly from 1928 when Americans were "buoyant, uninhibited and utterly happy" (Galbraith 1975, 50), to the end of 1929. Growth of GDP turned into a steep decline. (Attachment 3). World trade and industrial production was sent into a three year long decline as can be observed from Graphs 3 and 4. Germany got totally chained with the depression giving an opportunity for a fascist movement to rise into power. (Parker 2008, 91-93) Many people lost everything and decided to end their lives instead of trying to fight through. (Galbraith 1975, 149) And my research's main subject, New York Stock Exchange and its Dow Jones Industrial Average stock market index crashed from 380 points to 198 points in less than two months and from there continued the downfall to measly 41 points in mid 1932 as can be seen from Attachment 7. (StockCharts.com 2010) In short, 1929 is a "Year to remember" (Galbraith 1975, 25)



GRAPH 3: Global industrial production, index (VOX, 2010)



GRAPH 4: World trade, index (VOX, 2010)

6.2 Roaring twenties' stock market

The first nine and a half years of 1920s could be described as 'golden age' for the economy of The United States of America. It has been widely called as 'the roaring twenties'. Production was rising and the amount of unemployed was reducing. 22,800 new manufacturing plants were founded during 1925-1929 raising the total amount to 206,700. In 1929, 5,358,000 automobiles were produced compared to 5,700,000 24 years later. (Galbraith 1975, 31) Prohibition had been set into action which was supposed to make the American worker "more productive and dependable" (Galbraith 1975, 119) The Dow Jones Industrial Average (DJIA) stock market index was showing increases steadily throughout the 20s, from 64 points in mid 1921 into average of growth of 40 points / year until the end of 1929. If the pace of growth would have continued to the end of 1929, the approximate mean annual growth for the nine years would have been 20%. (Attachment 7, StockCharts.com 2010)

Approximate growth for DJIA 1921-1929 using 20% rate	
1921	64
1922	113,92
1923	136,704
1924	164,0448
1925	196,8538
1926	236,2245
1927	283,4694
1928	340,1633
1929	408,196

TABLE 1: Approximate growth for DJIA 1921-1929

The first irrationality in the economy appeared in 1925, when a bubble formed in the Florida land markets, described in Chapter 3.2. Even after that collapse, the general atmosphere that "God intended the American middle class to be rich" (Galbraith, 1975, pp.35) stayed strong. Foreign money was flooding into USA as European countries were paying back the debt they had taken because of WW1. They also had to take new debts, about one billion dollars in 1928, to rebuild their shattered economies. (Parker 2008, 8, 29)

In order to help the European countries, in 1927 the Federal Reserve bank cut the rediscount rate from 4 to 3,5 percentage which gave plenty of spare money available to banks who then gladly invested it into common stock. "From that date, according to all the evidence, the situation got completely out of control." was stated by a professor Lionel Robbins at the time. (Galbraith, 1975, pp.38-39) Following the monetarist policy by lowering interest rate, and therefore handing out cheaper money, can not be the only reason for speculative frenzy as can be observed from Attachment 6. There have been times when money has been even cheaper but no speculative bubbles have formed so other reasons have to be found. (Schiller xx)

Characteristic of that time was that the people involved in large businesses, professors of economics and managers of banks were being treated as 'oracles' of business and everything they said or done was taken very seriously. If a company's director said to the public that their stock was undervalued, it then rose marvellously because the director must have known what he was talking about. (Galbraith, 1975, pp.41-42) It should be mentioned that there were also people who were worried that the magnificent growth was due to speculation rather than fundamentals of economy. One of them was 1928 elected president J. Edgar Hoover who mentioned in his memoirs that "as 1925 he became concerned over

the ‘growing tide of speculation’.” (Galbraith, 1975, pp. 44) But as time went on, these thoughts could not be picked up from his actions as a president. Quite on the contrary, he was supporting a *laizzes faire* policy which basically means: It is best to do nothing. (Galbraith 1975, 44)

6.2.1 Amount of stock being traded in 1928

Instead of cooling the speculation, new records on the amount of trading were being made frequently. The chart below illustrates the incredibly rapid growth in the popularity of trading stock. What was also striking about the ongoing trading was the fact how it had became so central to the culture. (Galbraith 1975, 103)

Volume of trading at NYSE in 1928, shares/day	
12th March	3,875,910
27th March	4,790,270
12th June	5,052,790
7th November	4,894,670
16th November	6,641,250
1928 total	920,550,032
1927 total	576,990,875

TABLE 2: Volume of trading at NYSE in 1928 (Galbraith 1975, 43-45)

Not just the amount of trading was incredible, but the amount of trade that was made on margin (Galbraith 1975, 46), which I believe, was one of the main culprits in the speculative bubble that was happening and should be taken a closer look.

6.2.2 Margin trading

‘Trading on margin’ or ‘making margin calls’ is a form of trading where a trader buys a security from a broker, who is getting funding from banks, and pays, let’s say 25% of the total amount in cash plus fees, and the rest is covered by putting the bought security as a collateral for the loan. So in another words, you will pay 25% (margin) of a security but gain 100% of the benefits from an increasing stock price plus dividends.

In the 1920s the yield of stock was considerably lower than the interest rate of the loan. Dividends might have been 0-2% while the interest rate was 12% in the end of 1928. So the trader was only going to expect a gain in the stocks' value, which in fact used to be more than 12% per year. (Galbraith 1975, 47-49) The broker is happy because he can sell more securities therefore increasing his income from fees (interest rate) and the sold security is servicing the purpose of collateral. The trader is happy because he could get hold of a security for only 25% of its price and can now see how its value is rising every day.

Both broker and trader are not worried about the collateral since it is steadily gaining value thus making the trade perfectly safe for both parties. (Galbraith 1975, 49) By using this method, you are able to get a hold of four times more securities than you could by actually buying the security with only your own money, in other words - paying 100% for it. This procedure is called in the financial world as 'leverage', which in the twenties was a new technique. It was later observed that the stock wasn't perfect collateral after all and leverage works as well on booming markets as on crashing markets - just to the opposite direction. (Chapter 7.3.1)

It must be mentioned, that margins were in fact historically high during twenties, (Smiley & Keehn, 1988 p. 132), but what made the speculation abundant, even with high margins, was the fact that "Never before or since have so many people become so wondrously, so effortlessly, and so quickly rich." (Galbraith 1975, 68) We will come back to leverage when discussing about the first established investment trusts in the USA and even more during the 2008 crisis.

6.2.3 Broker's loans

Because of the nature of 'brokers' loans', since the only reason of buying the security is the expected future value, they can be used to measure the amount of speculation happening in the market. (Galbraith 1975, 48) The figures are listed in Table 3.

Amount of brokers' loans USA 1920s, billions of dollars	
1920-1925	~1,0-1,5
1926	2,5
1927	3,5
June 1928	4,0
October 1928	5,5
December 1928	6,4
June 1929	7,0
October 1929	8,5

TABLE 3: Amount of brokers' loans USA, 1920s (Smiley 1988, 136)

Who were funding these brokers with exponentially increasing demand for money? Well, basically everyone since the interest rates of 6%-12% were high enough to attract banks and investors from all over the world to fund the brokers and the speculation. A 12% return on investment was beginning to be so high that it was more profitable for even companies to lend their surplus profits to fund speculation than invest into their own company. (Galbraith 1975, 49) Taking this fact into the Keynesian theory means that economic growth and stability was being lost since the investments companies made did not create any jobs or increase productivity, thus being wasted resources. (Chapter 4.2)

The growing amount of loans provided by others can be seen from Attachment 9 which lists the sources of brokers' loans from 1919 to 1930. Smiley and Keehn note that brokers' loans put out by banks couldn't have had the greatest role in the boom and crash. (Smiley 1988, 139) I agree with this statement, but trading on margin in general played a major role, giving chance for traders to over commit themselves into the boom. Even though margin rates were high, it still meant economical disaster for those who were in the markets with all of their equity + 30-40% borrowed on top of that. Table 3 shows that the amount of trading grew incredibly fast. One reason for this was that no action was taken to discourage margin trading, as can be noted from Chapter 7.3. Another reason why there shouldn't be any worry for the increasing amounts of loans was the fact that if stock prices kept going up, it did that because the prospects justified the price. (Galbraith 1975, 94)

6.2.4 Syndicates and manipulation of markets

If the ongoing growth and prosperity was not enough already, dubious ways of making profit were also in use. In 1929, more than hundred of New York Stock Exchange's issues were being manipulated by its members or partners. The principle of a typical operation was simple: A syndicate would be formed when number of traders gathered their resources together, called pooling in financial terms, and then invested into some stock, promising not to double-cross the operation in private actions. This concentrated buying of stock then naturally boomed its price, attracting interest of the people following the markets all over the country. These people would then invest into that specific stock raising its price higher. The syndicate could buy more of the stock to generate even more buzz around the stock in order to get more buyers outside of the syndicate. (Galbraith 1975, 103-104)

If everything went as planned, plenty of people would come to buy the stock. The syndicate could then sell off their position when the price was high enough. Contrary to what is the practice today with using insider information at trading, back then "there was never a more agreeable way of making money." (Galbraith 1975, 104) This way of thinking could be explained with the fact that both the public and the syndicate were making money. (Galbraith 1975, 104) It provided incentives for the insiders to participate in the speculation and boom since the method seemed to work just fine. In the limited arbitage bubble theory (Chapter 5.3) , this type of action is at an essential role

6.3 The role of the Federal Reserve

One of the main reasons why the bubble's growth could not be stopped is quite simple: nobody wanted to take responsibility for causing a crash. (Galbraith 1975, 59-61) There were also very influential people speculating to whom the end of the bubble would have meant a personal disaster. The most influential of these speculators was probably Charles E. Mitchell who was the Chairman of the Board of the National City bank, which was one of the two largest banks in NYC (now known as Citibank), and on top of that he "became class A director of the Federal Reserve Bank of New York", a top executive. (Galbraith 1975, 55, 63) There was a time when there might have been possibilities to end the speculation once and for all. People were becoming nervous as to whether the market could continue its booming growth. It would have required the Fed to force the brokers to increase the required margin on their loans and/or an effort by bank managers to denounce speculation publicly and warn that the market was too high. (Galbraith 1975, 58-59)

Problem was that the regulators didn not want to interfere with the booming market and no top bank executive wanted to have their name imprinted with ‘he who crashed the market and caused all the havoc that happened since’. (Galbraith 1975, 58-59) Because these opportunities were not used, a void was left to the nervous market to be filled with Mitchell’s words and actions: “We [National City] feel that we have an obligation which is paramount to any Federal Reserve warning, or anything else, to avert any dangerous crisis in the money market.” (Galbraith 1975, 63) and in order to avert this crisis, National City borrowed from the Fed and put that money into the markets, which was something Fed had just warned banks to not to do. That was all that Fed did though, so it could be said that Fed accepted the reassurance by Mitchell which removed all nervousness and made the markets strong and growing once again. (Galbraith 1975, 61-64) Events like this are prime examples of fundamental positive shocks in the behavioural finance theory, increasing the chance for a bubble to form and inflate.

This is a good example how in every event in the history single persons and their personal preference and actions can play a huge role. That makes these events so hard to predict and to create working theories which would have to involve a lot of psychological aspects. The same can be said from the 2008 crisis as we can see from Alan Greenspan’s actions during his time as the chairman of the Federal Reserve as described in Chapter 7.2.3.

The Federal Reserve had of course the normal tools like controlling interest rate at its disposal. The trouble in raising interest rate to discourage speculation was that it couldn’t have worked. For a speculator, it wasn’t a big deal if she paid 5% or 7% interest since her investment in 1928, let’s say Radio, appreciated 500% in value. On the other hand, the increasing interest rates would have hurt the normal businesses and farmers who had no part in the ongoing speculation. One factor that gave FED an excuse to do nothing was the increasing amount of loans companies were giving out. “By early 1929, loans from these non-banking sources were approximately equal to those from banks.” (Galbraith 1975, 57-58)

So it can be concluded that in this case, Fed should have been aggressive and determined in its actions early on. They could have set the direction for others to follow assuming they really knew what was going on and what was bound to happen. As the bubble continued to grow, it became harder and harder to burst it, so it could be said that they didn’t have a solid plan thought out so it was safer to do basically nothing. Or as Mr. Galbraith put this

into words: “More accurately, Federal Reserve authorities had decided not to be responsible for the collapse.” (Galbraith 1975, 67)

6.4 Appearance of investment trusts and funds

Let’s move a few blocks down on Wall Street from Fed back to JP Morgan and the other banks because an important phase of the boom was in the making over there. As the good times were continuing, it was even being said that the reason why stock prices were so high was due to not enough stock being available for sale. To fight against this positive problem, the New York banks looked at Britain for ideas. This is because Britain had come up with the idea of investment trusts as early as 1880 but the concept had not really reached the United States by 1920. But now there was real “ingenuity and zeal” (Galbraith 1975, 69) in NY banks to make more stock available for sale. To make this happen, the financial innovation of the time - the investment trusts or companies - fit into the purpose like a glove. (Galbraith 1975, 69, 72-74) “The virtue of the investment trust was that it brought about almost a complete divorce of the volume of corporate securities outstanding from the volume of corporate assets in existence”. (Galbraith 1975, 73)

6.4.1 Invention of leverage

That happened in practice for example like this: In 1929 an investment company “Michael, Michael & David Foundation” is founded by three respectable highly educated business tycoons who were treated as financial geniuses. They are deeply involved in American steel industry so they focus their investments on steel. They raise $30 million capital by issuing 10 million in 1,000,000 shares of common stock which will be sold with 12$/share, a $2 premium, since the three businessmen have such a good reputation that great profits are to be expected. The businessmen will make a nice profit of $2 million and people will get a piece of desired stock. 10 million will be raised in preferred stock and 10 million in bonds both having set interest rates.

This asset structure is well thought out to generate leverage. What happens is illustrated in the chart below: the investment company invests all of its gathered 30 millions of assets to common stock of steel companies. The steel stock raises 50% in a year and increases the amount of investment company’s assets to 45 million dollars. Since preferred stock and

bonds have a set interest rate, they can't be applicable to the risen value of the trust. Instead, the raise can be contributed to the common stock which had been sold to the public. They will see an increase of 150% in their stocks' value and will be most pleased. (Galbraith 1975, 82-83)

Investing all assets into common *steel companies'* stock, the leverage effect				
Common Stock	Preferred Stock	Bonds	Total value	Increase
10	10	10	30	50 %
25	10	10	45	
+150%	+0%	+0%	+50%	

TABLE 4: An example of leverage in booming markets

The business tycoons can at the same time establish another investment trust with the same principle, but instead of investing into steel companies, they invest into their own "Michael, Michael & David Foundation". The common stock of this investment company increases not by 150% but by 550% from the original increase of 50%.

Investing all assets into "*M, M & D Foundation*" common stock, the leverage effect				
Common Stock	Preferred Stock	Bonds	Total value	Increase
10	10	10	30	150 %
55	10	10	75	
+550%	+0%	+0%	+150%	

TABLE 5: An example of leverage in booming markets

This was considered as "the miracle of leverage" comparable to the invention of wheel at Wall Street. Everyone wanted to be part of trusts which invested into other trusts and so forth. (Galbraith 1975, pp. 83) At that time the fact that leverage works as well in falling markets – but to the other direction - was not widely known until the crash begun in October 1929. (Galbraith 1975, pp. 85)

6.4.2 Popularity of investment trusts

During 1928, 186 investment trusts/companies were founded and in 1929, 265 new trusts saw daylight. As the popularity of trusts grew, so did the amount of securities they sold to the public. In 1927, trusts sold 400 million dollars worth of stock and in 1929, a considerable amount of three billions. (Galbraith 1975, 75) "By the autumn of 1929 the

total assets of the investment trusts were estimated to exceed eight billion dollars." (Galbraith 1975, 75) The investment trusts gave a chance to more new people to enter the booming market since the trusts were treated with utmost confidence in their financial ingeniousness and ability to make the best possible profit. (Galbraith 1975, 80, 82) This relatively new branch of business was using the leverage enthusiastically. (Galbraith 1975, 85)

6.5 Summary of the events in 1929

The magic of leverage gave a great boost to the already inflating bubble. This brings many valid questions into mind, like why anyone did not question this method and in more general, the incredibly fast growth then? One reason is that this sort of financial innovation was regarded as completely new way of doing business thus something that should not be questioned. Another reason, which sounds naive but also emphasises the strong public support to the financial innovations, is that the American public had decided that they were meant to be rich. (Chapter 7.2) Whatever was happening at Wall Street was bringing more wealth and prosperity to the economy. After all, the economy had been growing the past ten years and future prospects were looking great for the most and even better for some. (Chapter 6.2) Nothing was indicating to slowing growth; FED, economists, the president and bankers all seemed to agree that "economy was fundamentally sound" and a new 'high plateau' of prosperity had been reached. (Galbraith 1975, 95)

The same ideas and reasoning can be found behind the pension funds' and investment banks' decisions in 2005-2008 to invest into new innovative financial products which gave higher profits without risk than anything else before. (Chapter 7.2) The reason why the bubble at one point stopped its inflation is still under debate. One reason I found out which relates to the behavioural finance bubble theory is the amount of speculators entering markets. There were about million people participating in the stock markets during the boom years. During the highest growth, during the end of 1928 and July 1929, only 50,000 new people entered the market, an increase of 5%. (Galbraith 1975, 102-103) It could be that the funds they provided were not enough to continue inflating the bubble fast enough, giving people doubts about the ever continuing growth.

7. THE HOUSING BUBBLE IN THE 2000s

"The private banks failed, the supervisory system failed, the politics failed, the administration failed, the media failed, and the ideology of an unregulated free market utterly failed." Prime Minister of Iceland, Johanna Sigurdardottir, commenting the collapse of Icelandic banks." (Iceland's Prime Ministers' Office, 2010)

In this section I will go through the events preceding the crash of 2008 in the same way as in Chapter 6 and making comparisons if similarities can be found. As the crisis is so recent, there are still ongoing debates on the details about what was actually going on. There is common agreement though on the major culprits which will be analyzed in my research. Sources in this study are taken from various newspaper articles, research papers and books. Because the crisis has affected the whole world, almost every economist and journalist have had their word on the subject.

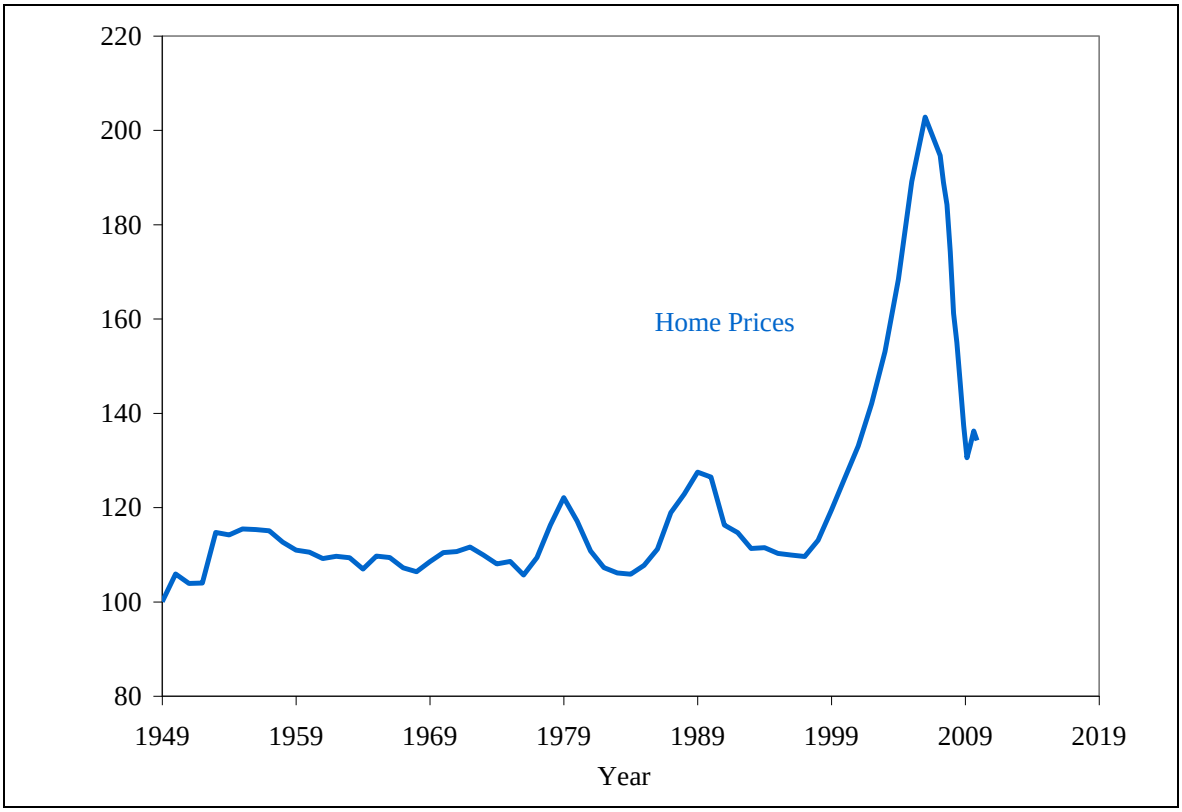
7.1 The basic setting

Before starting off, it is recommended to take a look at the charts on the page 20 and 21. The graphs remind how substantial the blow from financial crisis was on the world's economy. Trading decreased by 20% and industrial production suffered a 12% slump. This kind of statistics had not been seen since 80 years ago. What happened then during the 2000s? The stock market and the public had just witnessed the burst of dotcom bubble (more about this in Chapter 3.4) but the new information technology and low interest rates became contributing factors as reasons for economic growth. (Krugman 2008, 142) China and emerging markets were growing more rapidly than in decades and the whole world was enjoying steady economic growth. (Attachment 4, Attachment 5)

There was a lot of money searching for good investment opportunities as capital could easier be invested around the world. This increasing demand for investing was met not with investment into companies or production but with financial innovation which created products with higher rates of return. (Geithner, 2008) This general situation in the world can be compared to that in USA in the 1920s. Future prospects were looking bright and life was good like mentioned in Chapter 6.2. But as it has been observed in theories and in practice, bad times tend to follow good times. And again, a bubble formed in the markets prefiguring the impending crash which almost collapsed the whole financial system. Let's

take a look at what was special about this bubble and the events and what aspects were already familiar from the history.

7.2 The bubble forms



GRAPH 5: Index of home prices 1949-2009 (Shiller 2009)

As mentioned earlier, the crash of the world wide dot-com bubble had passed by only a few years before a new bubble was already in the making as can be seen from Graph 5. I will argue that there were two main causes which started to inflate the US housing markets. First, the historically low interest rate which was due to substantial capital inflows from especially Asian countries, and the decision from Fed to recover from the dot-com burst and 9/11. (Brunnemeier 2008) Second, banks and investing companies were busy creating new and fancy investment products, in other words financial innovation, which would be attracting for the largest investors such as pension funds. These two main plots could be also classified as macro economic (interest rates) and micro economic (financial innovation) (Chapter xx). I will be considering the view of Princeton University professor Markus K. Brunnemeier, who wrote a research paper “Deciphering the Liquidity and Credit Crunch 2007-2008” about the subject in 2009. For another point of view I will look

into Alan Greenspan's paper "The Crisis", 2010. He was the chairman of Fed during 1987-2006.

7.2.1 Subprime mortgages

If you had to single out one component which ties both the macro economic and micro economic side together in this bubble it would be subprime mortgages. From my own experience, as the bubble was bursting, there were mentions of this "subprime" in every single news broadcast. There was obviously something wrong with "the subprimes" as they seemed to bring everything down. The whole plot of the crash was not yet unveiled but subprime mortgages made it to the news quickly.

What were these subprime mortgages then? Well, as the word gives out, it is a "below prime" credit ranking. An opposite would be a "topprime" or "above prime" mortgage if wishing to use that analogy. Basically it meant that if a person who was applying for a loan to buy a house did not have good enough assets or income, she could be then classified as subprime borrower with greater risk. She would be required to accept higher margin rates in order to get the funding. In the US, this margin rate was at least 2% higher than with people having a better credit rating. (Lee 2007) In 2002, only 7% of all the mortgages in the United States were subprime mortgages but in just four years, due to increasing supply of money, the amount quadrupled to a bubbling 20%. (Greenspan 2010, 5-7)

The next obvious question is "How did credit rating of US loans become so important?" There were many factors which related especially with the mortgages and the housing market. Here comes into play the banking sector and financial innovations. Two trends had a major effect on the growing lending amounts and housing ordeal which followed. First, banks devised a way how they could repackage loans and sell them to various investors instead of holding the loans on their own balance sheets. This model was called "originate and distribute". It allowed banks to sell their risk to others. The other trend was banks using more and more shorter maturity instruments to finance their asset holdings. (Brunnemeier 2008, 78-79) These subjects will be analyzed next.

7.2.2 Collaterized debt obligations and credit default swaps

In my observation, the most ingenious innovation of the banks was the "originate and distribute" model. To sell the risk, banks organized "collaterized debt obligations" which I have illustrated in the chart below using the information from Brunnemeier's 2008 research. What was so significant about this model was that banks could off-load their risk by bundling up various loans, let's say subprime mortgages, corporate loans and bonds, then cutting up the bundle in a way so it could be sold onward. Because of this diversification of assets, AAA-rated structurized product could be created from BBB-rated loans. (Brunnemeier 2008, 78-79, 81) Comparison of credit ratings can be found from Attachment 11.

If an investor wanted to decrease the risk of her structured product even more, she could purchase a credit derivative called credit default swap (CDS). CDSs are contracts which protect the investment in a possible default for a cost of fixed fee. CDSs are usually sold by AAA-graded banks to guarantee that the investor will get her share in a possible default of her investment. Because banks regarded their structurized products failsafe, they gladly sold credit default swaps and investors bought them because they saw CDS backed security having low risk due to the fact that "the probability of the CDS counterparty defaulting was considered to be small." (Brunnemeier 2008, 79)

The risk never really left the banks though since they were actively buying the same kind of products. (Brunnemeier 2008, 80) The popularity of credit default swaps skyrocketed in the 2000s. Between 2002 and 2007 the gross notional amounts outstanding, meaning assets being insured by CDSs, was doubling every year from USD 2 trillion to peak of USD 58 trillion in June 2007. (Weistroffer 2009, 1-3) It should be noted that most of the speculation was based on two beliefs; the never decreasing value of houses and a low mortgage default rate. It was true, that housing prices had been rising constantly since WWII, but the prices did fall in the end, just like the stock prices of 1929 which were never supposed to go down. (Brunnemeier 2008, 81) (Chart 1)

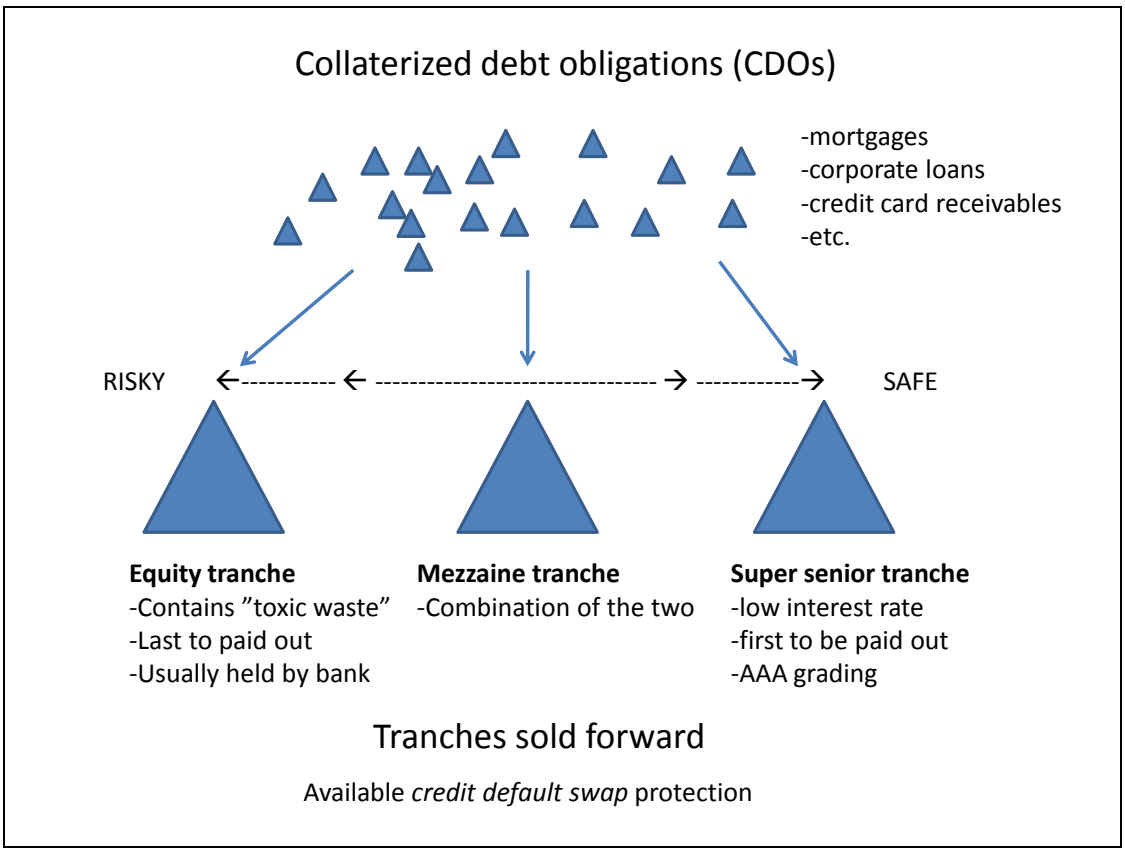
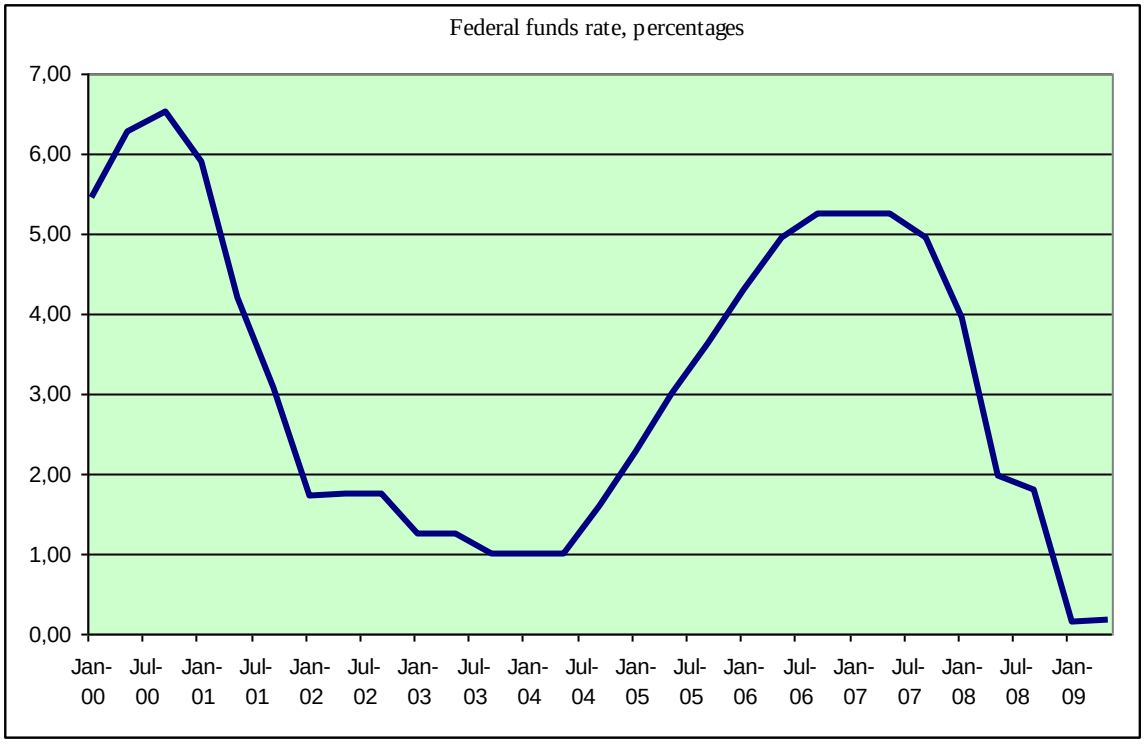


CHART 2: Collaterized debt obligations (Brunnemeier 2008, 78-79)

The thought process behind creating this method for selling structured products was well thought out, just like at creating leverage in 1920s. Banks could create AAA-graded products which would offer better return for profit than other products with the same grading because they could contain BBB assets which have higher return on profit e.g. subprime mortgages. It was kind of “financial alchemy”: when enough high risk assets were bundled together, it turned into a no-risk asset. They could be then sold to institutional investors such as pension funds which usually have regulatory requirement to only invest in AAA-graded products. (Brunnemeier 2008, 80) This was an example, but not the only one, of harnessing financial innovation to avoid regulation and rules. Other examples can be drawn from the “shadow banks” which were using these methods and many more to play the markets.

7.2.3 Alan Greenspan and Fed's interest rates



GRAPH 6: Federal funds effective rate, 2000-2009 (Federal Reserve 2010)

The Federal Reserve has two tools, controlling interest rate and being the lender of last resort, to influence the economic situations as mentioned earlier in Chapter 6. And the person, who is in charge of the Fed, has the power to do this. The man who held that power between 1987 and 2006 through the dot com bubble and the inflationary period of housing bubble was Alan Greenspan. Graph 6 shows his actions, which were also agreed by the politicians of the time, between the bubbles.

As he left the office in 2006, he was regarded as 'a monetary messiah' in front of the Congress. (Krugman 2008, 139) The general consensus was that he had managed to pull America back up from the dot com bust and 9/11 by rapidly slashing the interest rates close to 1%. But there are critics to his view, such as Keynesian supporter Paul Krugman, who thinks Greenspan managed only to cause another bubble following the next. (Krugman 2008, 151-152) In Krugman's view, the chairman of Fed did warn about impending crises but never really did much about it. He did not raise the interest rates high enough during the dot com boom and kept the rate low for too long to give opportunity for another bubble to form. (Krugman 2008, 142-144)

The other view for the exceedingly long period of low interest rates during 2002-2004 is that it was caused by others, mainly Asian economies. This was because the Asian

countries were depositing their surpluses into American markets, therefore bringing the rates down and increasing the money supply. Some professors are even saying that Greenspan is the only truly successful Fed chairman because he managed to freeze up the domestic monetary base. (Hummel & Henderson, 2009) This comes to show how difficult it is to find common ground in the economic matters.

7.3 Shadow banks

Shadow banking is a term created to describe the usual banking actions which instead of being part of traditional banks, works outside the normal banking rules and regulations. The system has been growing for the past 20 years due to increasing regulation on the normal banks. The downside of working outside the regulations was that there was not any federal guarantee for the deposited funds. (Roubini 2008) In the past decade the system had accumulated over $10 trillion in assets, almost matching up to the size of traditional banking system. (Geithner 2008) Shadow banks include such groups as hedge funds, structured investment products (described above) and non-bank mortgage lenders. They were working with a simple principle: borrow liquid very short-term funds and invest it into more illiquid long-term investments, such as property development, usually with high amount of leverage. (Roubini 2008)

The best example of an investment bank inflating the bubble during 2000s is Lehman Brothers, a company which was already around in the 20s and long before it. Lehman was working under the “shadow bank” regulations having free hands to do the most lucrative actions. The investment banks took the idea of leverage, created in 1920s, into a whole new level. (Tully 2008) What increased the use of leverage was the lower risk premiums caused by financial innovation. (Geithner 2008) The low interest rates and ever growing profits gave a feeling of security so it became a norm to use high leverage, in other words: borrow money to create an enormous portfolio of securities. The model of making profit was not anymore tied to traditional businesses but to the increasing value of assets. (Tully 2008) Exactly the same switch in the principles of making money happened in the stock boom of 1920s. (Chapter 5.7)

7.3.1 Leverage

How great was this amount of leverage being used then? In Lehman's case at the end of 2007, they had had 22 billion in equity supporting almost $700 billion in assets, a leverage of 30. For every 1 dollar they owned, they owed $30. We looked earlier how the leverage works on the booming market, now is a good time to see what happens in the other situation. (Housel 2009)

Leverage effect on falling markets, billions of $

Equity	Assets	Decrease
22	700	-5 %
-13	665	
-159%	-5%	

TABLE 6: Leverage in action, falling markets

With a leverage of 30, a drop of just 5% in total assets' value would eradicate all the equity of stockholders plus $13 billion, putting the company to the state of bankruptcy. This comes to show how high the stakes were and how common sense had failed. The excessive amounts of leverage were not put into practice only by Lehman's but by all the major investment banks such as Merril Lynch and Bear Stearns. (Tully 2008) If the amount of leverage was not impressive enough, the way it was financed added a new level to their way of making money.

7.3.2 Funding of shadow banks

As stated above, the main source of funding Lehman Brothers, Merril Lynch and other investment banks were using was very short-term. About one third of Lehman's funding, $182 billion, at the end of 2007 came from repurchase agreements, or "repo" loans. They worked in a way that if pension funds, hedge funds or other big institutional investors had surplus cash available, they could lend it to investment banks, for as short time as 24 hours, in exchange for securities as collateral. After the time period expires, the borrower promises to buy the collateral back at a small premium, in other words repurchase it. Usually the loan is extended to the next day so the actual repurchasing does not necessarily always happen. Again it seems that system is working perfectly and everyone is pleased. Investors invest the borrowed money with good rates and banks get a low cost of capital. (Housel 2009)

But, as always, there are downsides. In order to make business, they had to ask every day from banks if they are willing to lend $200 billion. Because that money was invested in

long-term assets, such as property development, it was crucial for the investment banks to get that funding. So if one day something happens in the economy which causes the banks not to extend the short-term repo loan, the investment banks have to sell their assets or find other ways of getting funding, in Lehman's case $182 billion. If no lenders would want to fund them, they would be forced to sell their long-term assets, which would require that a buyer has to be found. In uncertain and falling markets it might prove to be an impossible task. (Housel 2009) In short, this way of funding was cheaper but it created, in combination with a 30-to-1 leverage, an insurmountable risk for the investment banks to bear.

7.3.3 Incentives

As in the case of forming syndicates and pooling funds in 1929, there were also incentives for being greedier than others in the 2000s. The compensation systems can be identified as one of the main elements contributing to growth of the bubble. In one survey in 2008, financial services industry executives were being asked what they thought were the main factors forming the crisis, 31% answered monetary policy, 58% failing regulation, 70% incentives, 73% risk taking and culture. (Chesney & Stromberg & Wagner 2010, 1) Studying the role of the compensation systems has been very brisk as the system used during 2002-2008 was clearly not working and now it is important for companies, and the governments, to get proper systems in place. (Berk, 2008)

A few major points considering the incentives for CEOs to take risk were found by Chesney & Stromberg & Wagner in their research. Investment banks having CEOs who had both weaker ownership incentives and stronger risk-taking incntives were observed to suffer the greatest losses. Some executives of the largest financial institutions were found abusing their "too big to fail" status and took greater risk than the CEOs of smaller institutions. The one obvious reason why the incentive system grew to become an element to the crisis was due to the fact that the crash was not predicted so nothing was made to curb the risk taking; instead rewards were being handed out to the ones putting the pedal to the metal. (Chesney 2010, 20-23) One CEO who was practicing this behaviour was Dick Fuld of Lehman Brother's. In the end he was left with a company in bankruptcy and $500 million in his own pocket. (Sterngold 2010)

8. CONCLUSIONS

In this thesis I have covered the events and actions of the booms preceding the crashes of 1929 and 2008. My role as a writer has been more of that of a historian than laboratorian. After going through all the evidence, the quote from John Kennet Galbraith in the introduction still holds; “As a protection against financial illusion or insanity, memory is far better than law.” That is exactly what happened in both cases, financial insanity took over the rational, normal way of thinking. I believe it is something that everyone should be kept reminded about.

The goal of my studyl was to search answers for what was happening before and during the growth of the speculative bubbles and what, if any, they had in common. As a research subject the two biggest financial crises were very broad, but it should be noted that this type of wide-scale research is needed also to understand the basic mechanisms and elements which cause these bubbles. I came to notice, that another research should be done to compare the differences between the post-crash situations as that could not fit into this paper.

Let’s take a look at the situations in general and see what the events had in common. First off, it could be said that the housing bubble of 2000s was something we had *never* seen before. But that puts things into the wrong light, because it was in fact *everything* we had seen before:

- Asset bubble of Japan
- Financial innovation of 1920s
- A lapse of common sense of Tulip Mania
- The burst of dot com

In this light, things are put into another perspective. When looking at the different bubbles of the history, the 1920s boom stands out as the first modern case of speculative bubble with effects in a global scale. Sadly, I have come into the conclusion that I can not ask “How could the same happen after 80 years?” since the same happened already twice in 2000s and many times in between. What is significant and worth of research though, that it *did* happen 80 years ago.

As mentioned, one might think that the situation 80 years ago would be way different than now in the 21st century. The research comes to show that this was not the case. All the main elements for modern trading were already in place during the 20s so it could be taken as the 'ancestor' for the new era in speculative bubbles. It was interesting to see, what happened during than and what as of now. The macroeconomic theories and bubble theories laid a good framework to cover the two cases.

I came to the conclusion that financial innovations were the engine and reasoning behind why the level of growth should be accepted in the minds' of people. The bubbles also required necessary funding in order to inflate. In 1920s, trading on margin provided the funding in the first year of the booms. Around 1929, investment trusts appeared in the US, bringing leverage as a new way of funding and investing. This gave a huge boost to the already rapidly inflating bubble. Since playing the markets was a relatively new matter to the public, so they were listening the 'oracles' of the business world with a keen ear. And because the government did not want to interfere with the growing frenzy, it meant that whatever the oracles said held truth. This did not bring in millions and millions of people to the markets though. Instead, the stock market became central to the culture and the roaring twenties.

This same story could be told the crash of 2008. Funding to speculate in the real estate market was provided by once again by financial innovation. Investment banks came up with ideas how to trick big institutional investors such as pension funds to invest in risky assets by making them look like they were free of risk. At the same time interest rates were low and Asian countries were flooding funds to the US. Money, as always, wants to find the best place for profit and at the time it was the new securities created by investment banks. Again, nothing was done from governments' point of view. Interest rates were kept low and there was no way of influencing the investment banks because they were outside regulation. But as always, all good things have to come to an end. After no new investors entered the markets and new houses were being left unsold causing the prices to plummet thus causing havoc in all those banks using extremely high leverage.

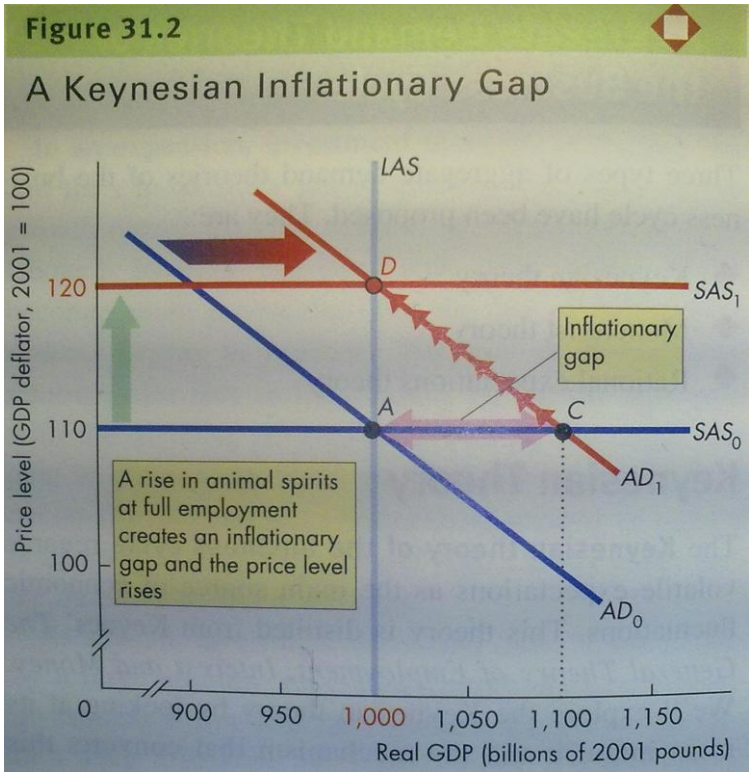
This gathered information and insight might have to be put into a test sooner than later. Countries of the European Union are currently passing law to form a 750 billion euro fund to protect countries in trouble so that their loans would not default. Hopefully we will not see a recreation of these crisises in the form of countries and continents.

To conclude the research: Table 7 below illustrates the comparison in one view.

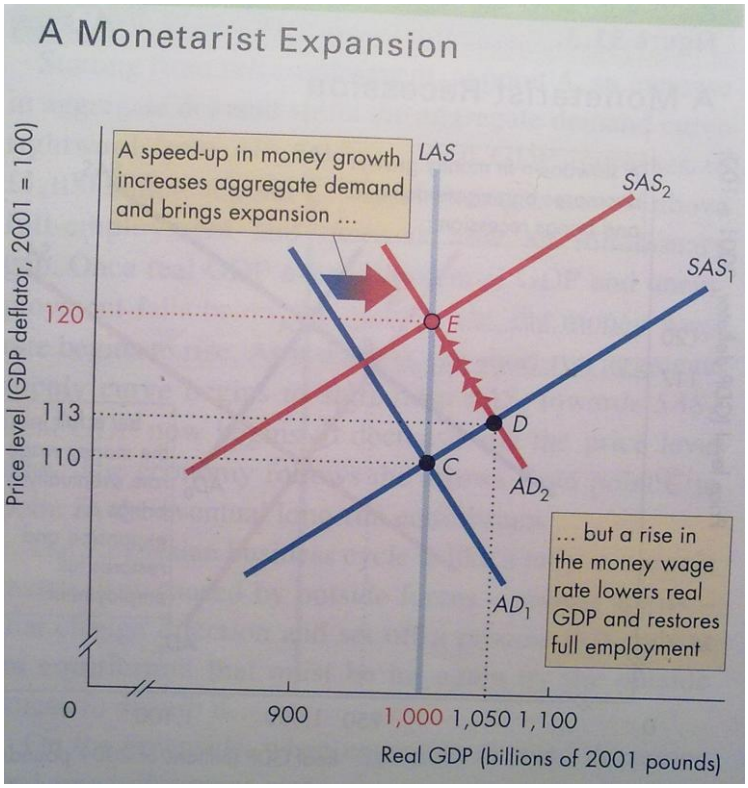
Comparison of the events preceding the crash		
	1929	2008
A speculative bubble	At the stock market of the USA	At the housing/mortgage market of the USA
Fed Interest rate	3,5%-5,0% Historically normal	1,0%-5,35% Historically extremely low
Financial innovations	-Leverage -Investment companies	-Trenching sub-prime mortgages and selling them forward -Shadow banks -Credit default swaps
Speculation on real estate	Not substantial	Substantial -Speculation on housing market caused the bubble
Future prospects	Great -New technological innovations -Growing industry production -Prohibition -9 years of growth behind	Good -Recovering from the dotcom bust -Recovering from 9/11 -Significant growth at emerging markets -7 years of steady growth behind
Efficiency of regulation	Not efficient -Fed did not want to take responsibility -Insider trading inflating the bubble	Not efficient -New innovations to avoid the regulation -Investment banks not being regulated
Role of incentives	-Insider trading was easy to pull off -A reason to continue inflating the bubble	-Taking more risk equalled to better pay -Stock options were handed out, $500 million for some CEOs
Involvement outside of the USA	Great -European countries paying debt -Flow of funds not so easy	Enormous -Banks and funds around the world investing on sub-prime mortgages and US banks -Emerging markets' governments depositing funds to US -Easy flow of funds
Striking features	-Trading at Wall Street became central to the culture	-Amount of risk taken reached incredibly high levels -Incentives

TABLE 7: Comparison of events preceding crashes of 1929 and 2008

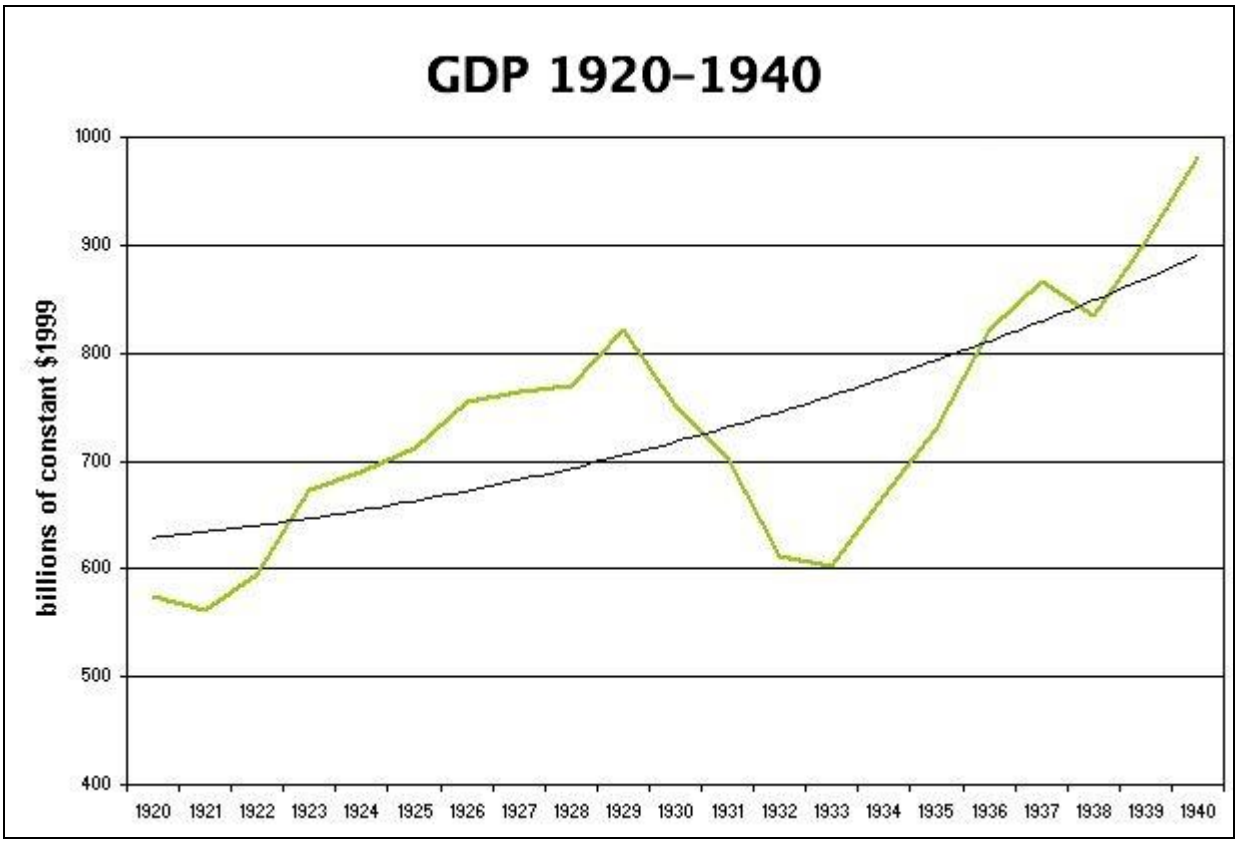
Attachment 1: A Keynesian Inflationary Gap (Parkin & Powell & Matthews & 2005, 704)



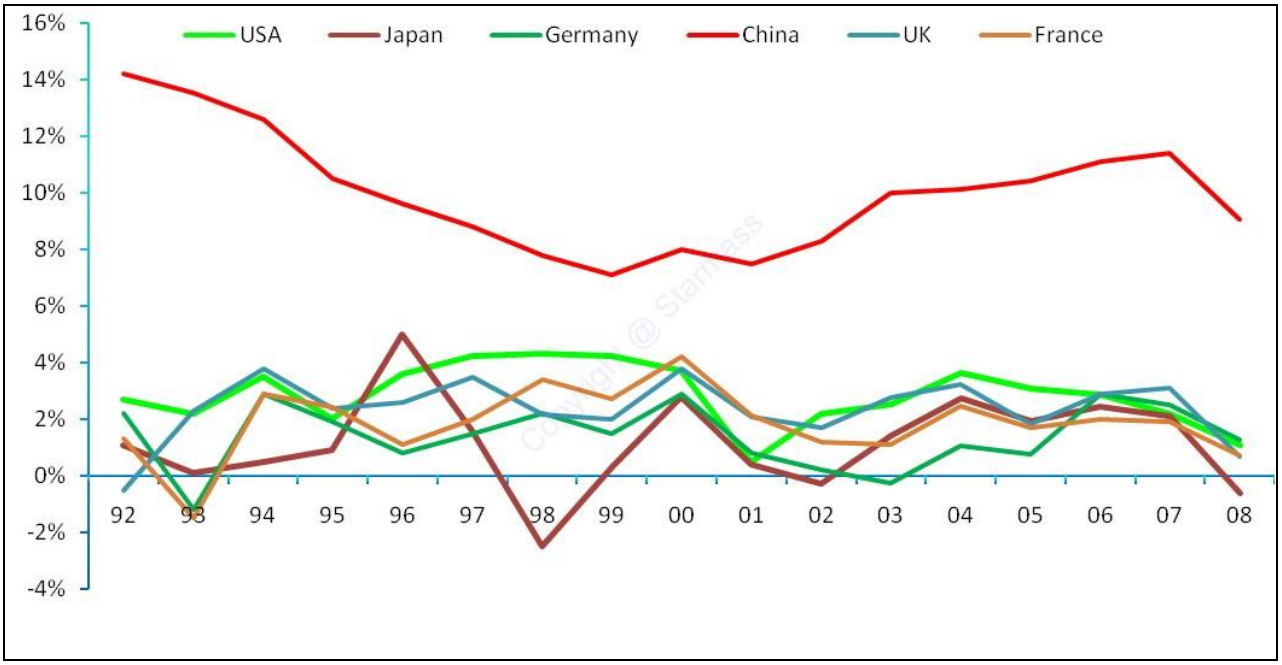
Attachment 2: Monetarist Expansion (Parkin & Powell & Matthews 2005, 706)



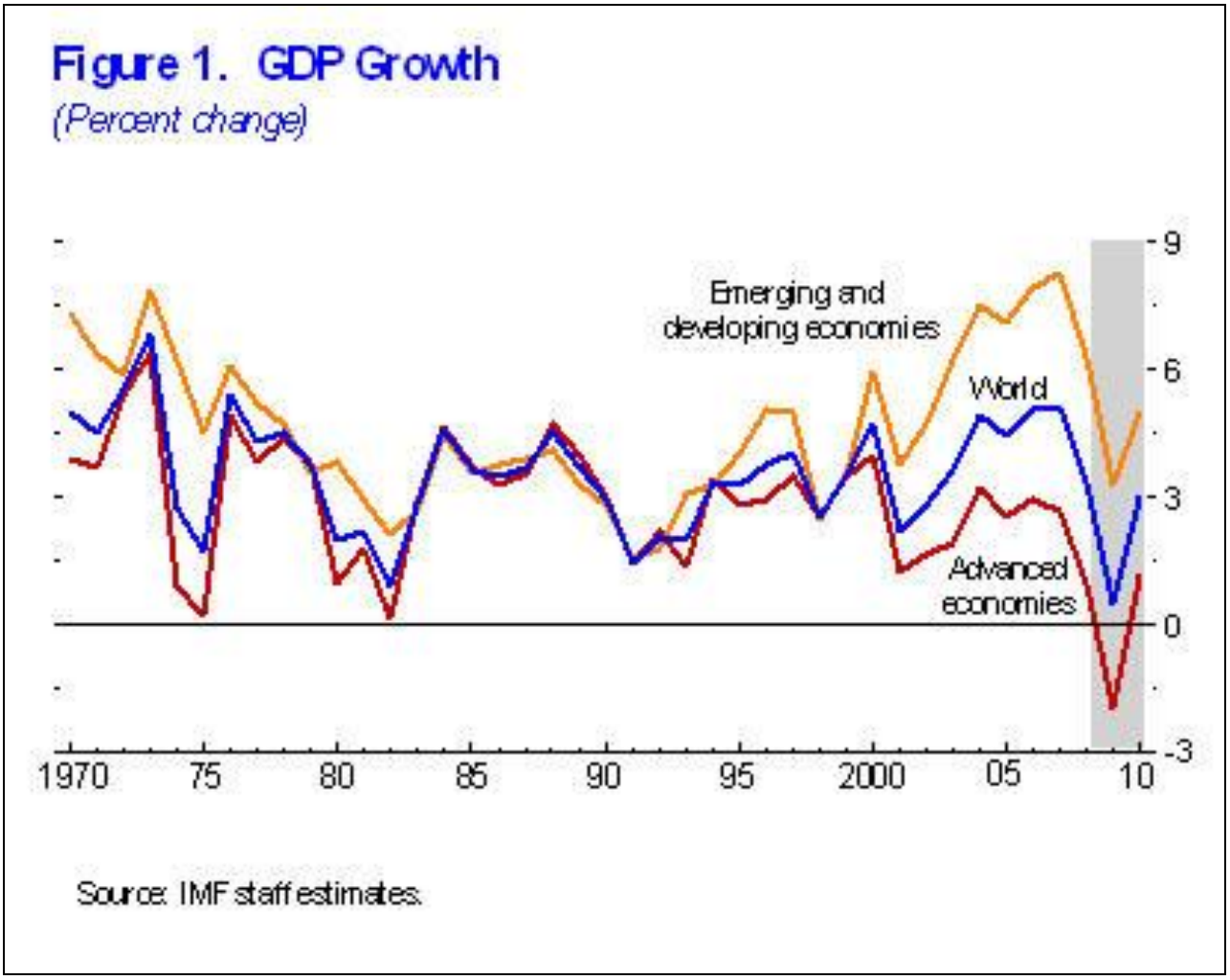
Attachment 3: USA GDP annual pattern and long-term trend, 1920-40, in billions of constant dollars (Carter 2006)



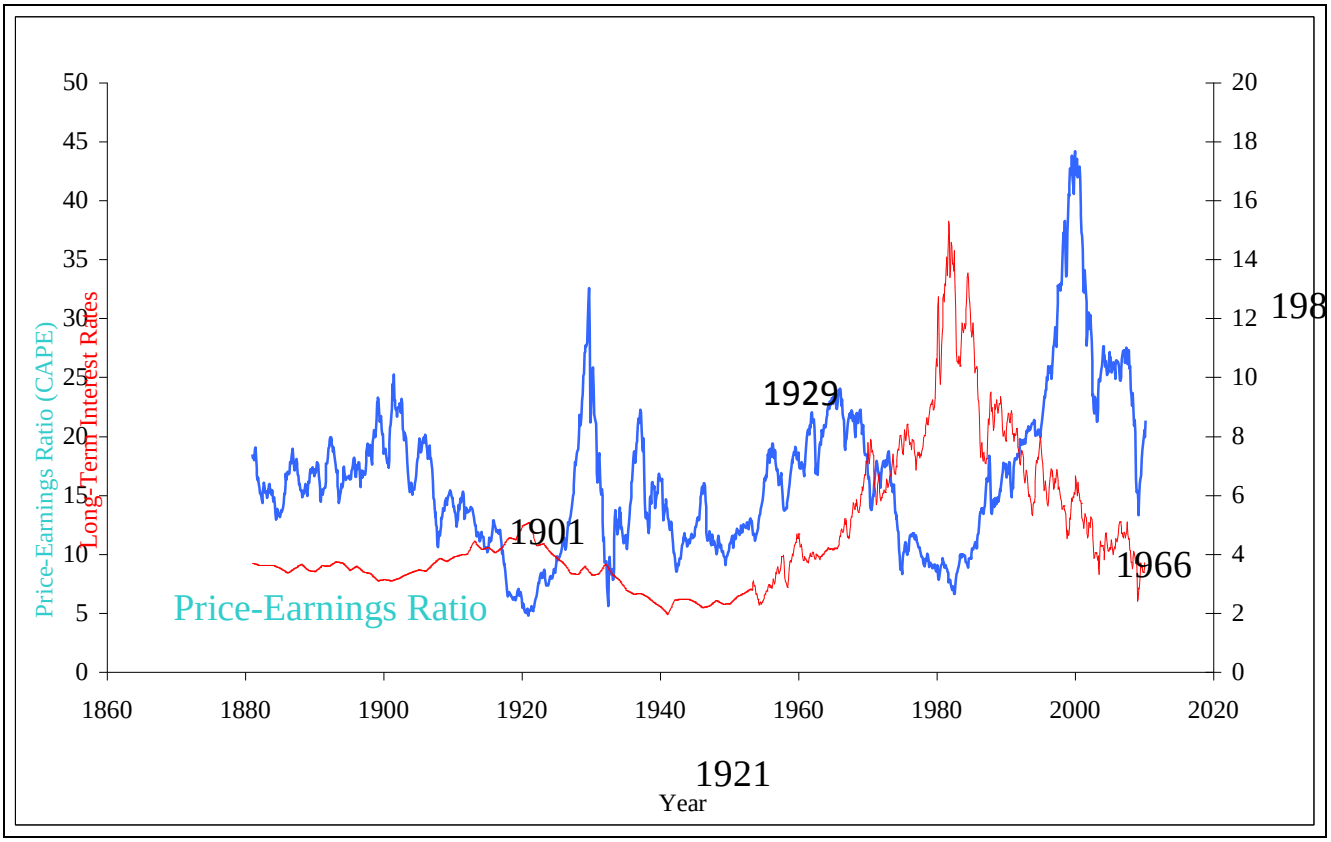
Attachment 4: GDP growth rate of five largest countries by GDP, 1992-2008 (Starmass 2008)



Attachment 5: GDP Growth 1970-2010 estimate (IMF 2009)

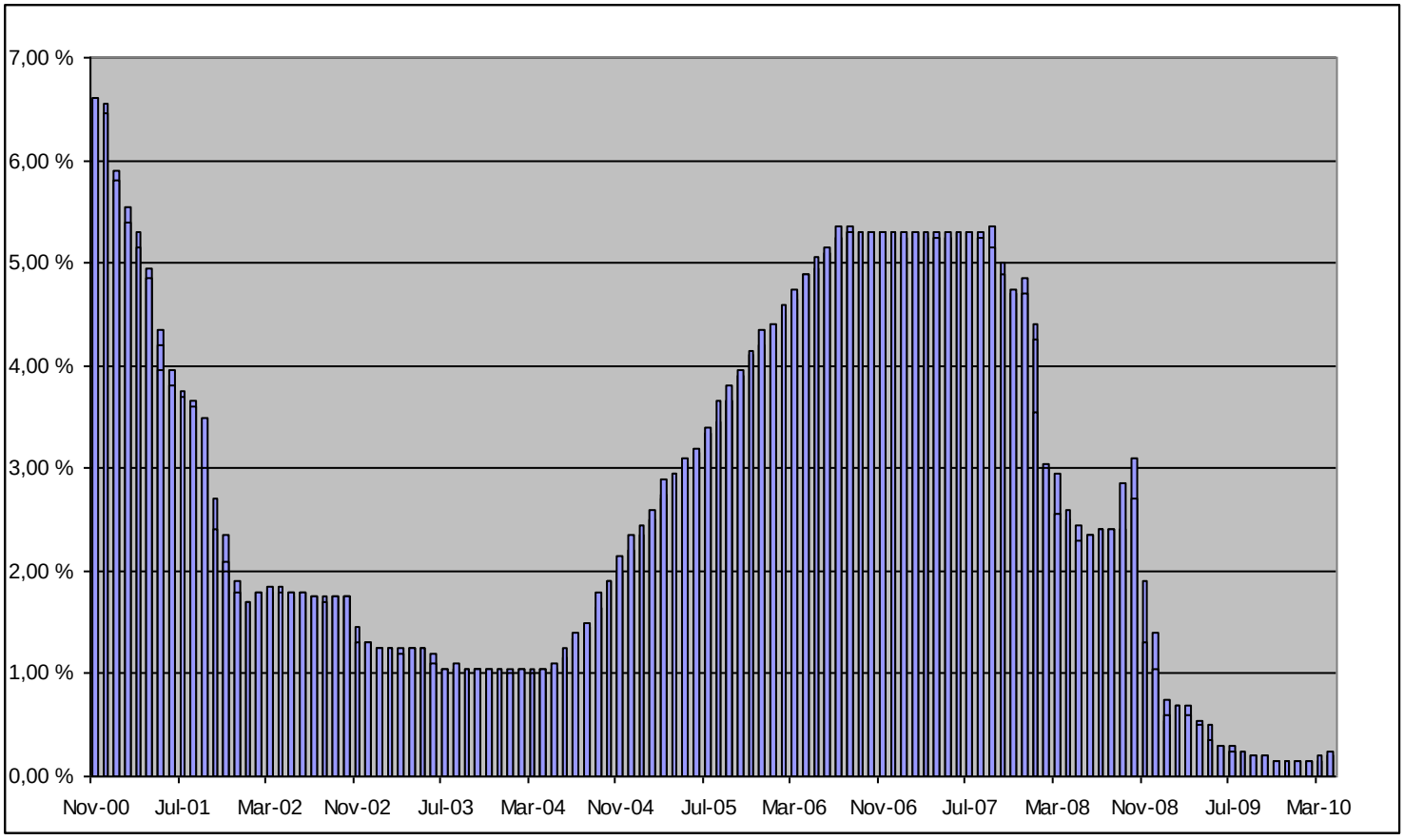


Attachment 6: P/E Ratio, Long-Term Interest Rates, 1880-2010 (Schiller xx



Attachment 7: Dow Jones Industrial Average, 1920-1940 (StockCharts.com 2010)

Attachment 8: Federal Reserve seasonal credit interest rates 2000-2010 (Federal Reserve Discount Window 2010)



Attachment 9: Sources of brokers' loans on the New York Stock Exchange (Smiley & Keehn 1988, 136)

SOURCES OF BROKERS' LOANS ON THE NEW YORK STOCK EXCHANGE

Date		Total[a]	Percentage Shares NYC Banks	Out-side Banks	Others	Date		Total[a]	Percentage Shares NYC Banks	Out-side Banks	Others
1919	3-31	1,060	52.83	18.87	28.30	1925	3-31	2,420	42.98	28.93	28.10
	6-30	1,510	50.99	22.19	26.82		6-30	2,660	43.23	28.95	27.82
	9-30	1,590	48.43	24.53	27.04		9-30	2,930	36.18	32.43	31.40
	12-31	1,610	44.41	26.09	29.50		12-31	3,550	40.85	29.58	29.58
1920	3-31	1,420	32.75	27.82	39.44	1926	3-31	3,000	34.33	30.17	35.50
	6-30	1,400	31.79	21.43	46.79		6-30	2,930	36.18	26.62	37.20
	9-30	1,350	27.04	22.22	48.74		9-30	3,220	29.81	31.06	39.13
	12-31	1,080	36.11	26.39	37.50		12-31	3,290	35.26	25.23	39.51
1921	3-31	1,020	31.86	28.43	39.71	1927	3-31	3,290	29.18	27.66	43.16
	6-30	1,000	36.50	25.50	38.00		6-30	3,570	31.65	27.17	41.18
	9-30	990	37.37	25.76	36.87		9-30	3,910	29.92	27.11	42.97
	12-31	1,190	45.80	22.27	31.93		12-31	4,430	34.99	23.70	41.31
1922	3-29	1,300	44.23	23.85	31.92	1928	3-31	4,640	27.37	23.06	49.57
	6-28	1,670	47.31	22.16	30.54		6-30	4,900	22.04	19.59	58.37
	9-30	1,820	46.98	24.45	28.57		10-3	5,510	15.97	18.51	65.52
	12-31	1,860	50.81	22.04	27.15		12-31	6,440	25.47	14.21	60.33
1923	3-31	2,000	43.50	26.50	30.00	1929	3-27	6,825	16.12	11.36	72.52
	6-30	1,730	46.24	24.28	29.48		6-29	7,070	19.24	9.41	71.36
	9-30	1,520	39.47	27.63	32.89		10-4	8,525	12.84	9.27	77.89
	12-31	1,580	45.57	25.95	28.48		12-31	4,110	29.20	11.19	59.61
1924	3-31	1,690	43.79	26.63	29.59	1930	3-27	4,550	32.42	19.01	48.57
	6-30	1,740	54.60	21.84	23.56		6-30	3,795	49.67	12.65	37.68
	9-30	1,970	54.31	22.34	23.35		9-24	3,670	46.73	20.71	32.56
	12-31	2,230	51.57	23.77	24.66		12-31	2,105	60.81	10.21	28.98

[a]Total brokers' loans in thousands of dollars.

Attachment 10: Comparison of IT companies' market value of 2000 to 2008 (FT Global 500 2000, FT Global 500 2008, US Department of Commerce)

Market value of USA's top 6 technology companies, millions of dollars

		May 2000			December 2008	
Microsoft	# 1	586196		# 1	172930	
IBM	# 5	201014		# 2	113065	
Cisco	# 2	348964		# 3	95437	
Intel	# 3	277095		# 4	81538	
Apple		-		# 5	75008	
Google		-		# 6	73693	
American Online	# 6	176266			-	
Lucent	# 4	237667			-	
		1827,202	billions $		**611,671**	billions $
% of GDP		18,0	%		4,26	%

USA GDP, billions of dollars	
2000 Q1	**10165**
2008 Q4	**14347**

Attachment 11: Credit ratings (Heakal, 2010)

Bond Rating			
Moody's	**Standard & Poor's**	**Grade**	**Risk**
Aaa	AAA	Investment	Lowest Risk
Aa	AA	Investment	Low Risk
A	A	Investment	Low Risk
Baa	BBB	Investment	Medium Risk
Ba, B	BB, B	Junk	High Risk
Caa/Ca/C	CCC/CC/C	Junk	Highest Risk
C	D	Junk	In Default

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